The Teaching of Geography

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G. H. Gopsill

Students who are preparing to become teachers of geography will find assistance of two sorts in this book. First there is a statement of those principles which form the substance of sound practice and which have been derived from the foresight of the philosopher-teachers over the last half-century. And second, these principles are applied in practical form, in terms of lessons which have been given. Neither principles nor applications are intended to be exhaustive, but it is hoped that both will help a teacher to clarify his own ideas, and to develop distinctive personal techniques which keep abreast of modern practice, and anticipate the trends of the future.

Modern methods of illustration, both aural and visual, are fully dealt with, and much attention is given to the 'incidental' aids to geographical teaching in the form of topical events, films, general reading, journeys out of school, ship adoption, and so forth. There is a separate section concerned with the planning of geographical work—arranging a syllabus and equipping a room. The text is illustrated with numerous figures in line and half-tone.

There is a comprehensive bibliography for each chapter, and four appendices give additional information relating to sources of geographical material, and the operation of optical apparatus.

The author is Lecturer in Education, University of Nottingham.

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THE TEACHING OF GEOGRAPHY

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THE TEACHING OF GEOGRAPHY

BY

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S.C.E.R.T. West
25.3.

LONDON
MACMILLAN & CO LTD
NEW YORK · ST MARTIN'S PRESS
1958

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First Edition 1956
Reprinted 1958

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8.9.95

MACMILLAN AND COMPANY LIMITED
London Bombay Calcutta Madras Melbourne

THE MACMILLAN COMPANY OF CANADA LIMITED
Toronto

ST MARTIN'S PRESS INC
New York

PRINTED IN GREAT BRITAIN

5556

FOREWORD

By Professor N. Haycocks,
Professor of Education in the University of Nottingham

One of the problems of the teacher is that of keeping abreast with the new knowledge, techniques and outlooks affecting his subject. Schooling cannot remain static, and as new insights into child nature, greater refinements in aims and purpose, and more complicated equipment and apparatus come along, classroom practice must constantly be modified if the best use is to be made of them.

In this book, Mr. Gopsill seeks to present a modern and realistic view about the teaching of geography. He is anything but narrow in his presentation and rightly indicates first the historical background to the teaching of the subject, and then the educational purposes which its inclusion in the curriculum can reasonably hope to serve. In his chapters on the various aspects of teaching method, it is plain that Mr. Gopsill has not only made good use of the discoveries of others, but has also thought deeply about his own experiences as a teacher and has himself experimented boldly and sensibly in the classroom. Teachers will find in this book much to stimulate them, and those training to be teachers will discover in Mr. Gopsill a wise and friendly guide.

It is the fashion in many countries—and not only in those we label " totalitarian "—to prescribe for the teacher the subject-matter which he is expected to treat, year by year of his course, and sometimes also to indicate the methods which should be followed. In this country, we prefer to look upon teaching as a personal situation, the details of which must be left to the free initiative of the teacher himself. Mr. Gopsill has, quite rightly, not sought to lay down in detail exactly what should be taught, age-group by age-group, nor by what means; children and teachers and opportunities vary too much for this to be a useful approach. What he has done is to set out clearly the important considerations and methods which all geographers need to bear in mind, the modern trends and emphases, the basic material. It is then for each individual teacher to decide how to make his own use of these ideas. The purpose of a book on teaching method is not to remove the need for thought, but to provide the material and the ideas which will provoke thought and further study. This clearly has been Mr. Gopsill's objective and it is my hope and belief that his book will help geographers to think anew about many of the aspects of the teaching of their important subject.

NORMAN HAYCOCKS

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INTRODUCTION

It has been said by one who has the gift of words that having the right attitudes is far more important than knowing the right things. There is no novelty nowadays in suggesting that the study of geography is largely an attitude of mind. We have recently been reminded of it by Professor Frank Debenham[1] and he adds that although training will rarely actually create the attitude, it will no doubt intensify it.

It is my conviction that children find their principal satisfaction in geography when they have the chance to get to grips with things as they really exist, and that teaching is most likely to be successful when the subject is brought into close contact with realities, and when teachers encourage and direct in their pupils an attitude of enquiry and critical appraisal. If therefore the *attitude* has its origin in a natural and sometimes importunate curiosity, then the *training* (i.e. the skilled organisation of material arising from personal teaching) adds the necessary element of disciplined method which prevents a child's zeal from running to waste in aimless or unprofitable occupations.

In this book I have tried to demonstrate that it is this combination of natural curiosity and disciplined direction which is the proper basis for geographical teaching. After a first chapter devoted to examining the development of ideas on teaching over the last half century, I have made certain suggestions in subsequent chapters which may help a student to work out his own techniques from first principles. Naturally, much of this work comes straight from class-room practice, and I have been helped very considerably by my own students, not only in the form of direct assistance, but more subtly in that their work has often induced me to pause and to reconsider my own views. I acknowledge here my debt to very many of them. It is also proper to mention some whose work appears here,—Mr. L. V. Pape, B.Sc. and Mr. W. L. Barnard, B.Sc., who drew many of the diagrams; Mr. C. E. Crawford, B.A., Mr. T. M. Milner, B.Sc., and Mr. A. J.

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[1] Professor Frank Debenham, "The Diamond Jubilee Address" in *Geography*, November 1953.

Evans, B.Sc., who contributed examples of blackboard work or visual displays ; and Mr. J. H. Wise, B.Sc., who helped with the making of models. I am especially grateful to Mr. K. G. Allen, senior geography master at the Glaisdale Secondary School, Nottingham, for permission to include at Appendix 1, a short summary of a local school journey undertaken by him and some of his pupils. I also give my thanks to Professor Norman Haycocks, M.A., for writing the foreword, and to my friend Mr. G. J. Eltringham, M.A., for his abundant patience and meticulous attention to detail when reading the proofs.

G. H. GOPSILL

NOTTINGHAM
June 1955

ACKNOWLEDGEMENTS

I acknowledge with thanks, permission to make substantial quotations from the following works: Bernard Llewellyn, *I Left My Roots in China*, Messrs. Allen & Unwin; Capt. Joshua Slocum, *Sailing Alone Round the World*, Messrs. Rupert Hart-Davis; Sir John Hunt, *The Ascent of Everest*, Messrs. Hodder & Stoughton; Colin Beale, *Look and See*, The Edinburgh House Press; *The Daily Telegraph*; also the courtesy of Messrs. Aerofilms, Photographers, for the use of the aerial photograph at Fig. 53, and of Methuen & Co., Ltd., and the authors for permission to use the map at Fig. 25, from their book *Maps and Diagrams*, by F. J. Monkhouse and H. R. Wilkinson.

SECTION I

CHAPTER I

THE NATURE AND SCOPE OF GEOGRAPHY IN SCHOOL

> Any technique of teaching must be true to the nature of the subject. And the only method of discovering what is true to the nature of a subject is by critical examination—philosophical examination—of the subject on the one hand, and of the assumptions about the subject implied in existing techniques on the other.
> W. H. BURTON, *The British Journal of Educational Studies*, Vol. II, No. 2

It is not at all unreasonable to expect that those who are proposing to teach geography in school should first address themselves to three questions before they start. These are :

(i) The nature of their subject,
(ii) The aim which they have in view,
(iii) How to set about their job.

They should be able to arrive at an answer backed by the considerable weight of competent authority (on first principles at least, if not on the precise methods of putting the principles into practice), because these questions have been occupying the minds of the geographers and of the teachers for the last half-century. Although fashions in education, as in everything else, tend to change with the years, it is most noticeable how a few men of vision with a foresight denied to the common man, have periodically discovered fundamental truths in advance of their time. These truths become established and unchanged even though successive generations of practitioners serve them up again and again in different guise, rather as a cunning chef might produce novel and exciting dishes from the same basic ingredients. It is profitable, therefore, when considering these three questions to go back far enough, and to see what the great thinkers have thought and to examine the teaching of the great teachers. This helps the student of today to see the modern view in its proper perspective, to project it as it were against the background of developing ideas over the years, and to evaluate their worth. It is not difficult to do this in the case of geography for we do not have to go back very far. It is a curious thought that a little over half a century ago there was practically no geography teaching in this country as we understand it today. Before the nineteenth century the universities would have none of it, apart from the quite exceptional case of Richard Hakluyt, usually considered the first to introduce geography in the University of Oxford in the reign of the first Elizabeth. In the nineteenth century, the English universities taught it, if at all, in a perfunctory fashion, with the possible exception of the University of London. Since the universities paid so little attention to it, so did the schools, for nineteenth-century education was marked by a singular preoccupation with those subjects which could be offered for examination, and a reluctance to waste any time on those which could not. In 1860 Thring of Uppingham dismissed geography as merely the study of shapes. For a while there was a scheme whereby boys from the public schools could compete for medals first presented by Francis Galton in 1868. Few took advantage of it however, and those who did were usually specially coached outside the schools.

So at this time the circle was complete. Without status in the universities the subject was literally barred from the schools. No specially trained teachers emerged who could teach it, and without teachers and in the absence of university opportunities, the schools had little incentive to adopt it.

All this was in marked contrast to the position on the continent, especially in Germany, where traditions of geographical teaching had been firmly established around the names of such outstanding persons as Ritter, Humboldt, and von Richtofen. In this situation, the Royal Geographical Society took upon themselves the responsibility of interesting public opinion in the state of geography and its teaching. To this end the Society addressed a memorandum to the universities in 1874 hoping to enlist their support, but when it was stated that: "Geography implies a compendious description of all the prominent conditions of a country . . ."[1], it is small wonder that the universities were not particularly interested, nor is it surprising that Professor G. H. Darwin of Cambridge should say that he did not see how geography pure and simple could ever be made a subject of intellectual training.[1]

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[1] *Royal Geographical Society Memorandum to the Universities* 1874.

A little later, the Royal Geographical Society took a more positive step in inviting J. Scott-Keltie to examine the state of geography teaching in this country and on the continent, and to report to them his findings and his recommendations. He noticed the unhappy contrast between geography teaching here and the flourishing traditions in the German universities, and as a first step he recommended at the least, that a Readership in Geography should be established in one of the universities.[2]

This was the position in the period of the 1880's and it is from this time that we shall find the first attempts to answer the three problems stated above.

Let us now take them in order:

1. The Nature of Geographical Studies

An age in which the scholars could describe the study of Geography as "merely the study of shapes" or "a compendious description", could hardly be expected to make very much contribution to geographical education. Yet these and other even less flattering descriptions probably represented a perfectly true picture of the nature of geographical studies at that time. In the middle of the nineteenth century geography, if it had any place at all, was regarded as an offshoot from, and entirely at the service of, the study of geology. The powerful influence of such a prominent geologist as Lyell took possession of geography so completely that in 1885 Sir Archibald Geikie was able to say: "In its true sense, geography is a part of geology. . . ."[3]. The natural result of this origin was an altogether undue emphasis on the physical side of geography, and a denial that any other sort of geography was at all possible. This emphasis persisted even when a more liberal interpretation of geographical studies admitted the possibility of a more human approach; the tendency to cling to the original conception of physical geography as a separate study gave rise to a most unfortunate dichotomy—"physical geography" which was regarded as the "real" geography, and "geography" which concerned itself with a rather cursory description of foreign countries, the two subjects being taught separately and having very little in common.

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[1] J. F. Unstead, "H. J. Mackinder and the New Geography", *Geographical Journal*, Vol. 93, 1949.

[2] J. Scott-Keltie, "Report on Geographical Education", *Royal Geographical Society Supplementary Papers I*, 1885.

[3] ibid.

In this, as in all other aspects of human endeavour, we find some few thinkers in advance of their time, and it is from them that a more generous view of the nature of geography originally came. Mary Somerville's *Physical Geography* first appeared in 1848, written in a style rather more readable than is usual in such works, stressing for the first time that physical and human facts are very closely interrelated. "The influence of external circumstances on man," she wrote, "is not greater than his influence on the material world. It is true that he cannot create power . . . but he dexterously avails himself of the powers of nature to subdue nature."[1]

A little while later in 1872 Francis Galton as the president of section E, of the British Association announced that "the configuration of every land, its soil, its vegetable covering, its rivers, its climate, its animal and human inhabitants, react upon one another. It is the highest problem of geography to analyse their correlation and to sift the casual from the essential",[2] thus expressing his conviction of the interdependence of the various branches of geographical study, a view which was far from widely held at that time.

Among these prophets before their time there eventually emerged the dominant figure of Sir Halford Mackinder. With lucid expression he soon formulated the ideals of the subject and forecast its pattern. Around these ideals geographical thought really began to crystallise into anything like modern form. Mackinder was still a young man when the vitality of his teaching and the enterprise of his views were first noticed.

When quite by chance in the Christmas vacation of 1885 he happened to pass a wet afternoon visiting an exhibition of "geographical appliances" he there met Scott-Keltie, who in the previous May had submitted his report on the Teaching of Geography to the Royal Geographical Society.[3] This chance meeting had far reaching consequences, for after some discussion with Francis Galton and H. W. Bates, then Secretary of the Royal

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[1] Mary Somerville, *Physical Geography*, 1848.

[2] Francis Galton, President, *Report of the British Association*, Section E, 1872

[3] op. cit.

Geographical Society, Mackinder was invited to address the society. This was arranged, and in 1887 he presented his famous paper on the "Scope and Methods of Geography",[1] in which his liberal views were forcibly expressed. It cannot have been easy for a young man of 25 years to expound an interpretation of geography which he knew to be contrary to that which was commonly accepted, but in spite of the august company, his tone was forthright and the argument sound. The paper and the discussion which followed still make instructive and inspiring reading.

Mackinder here defines geography as the subject whose main function is to trace the interaction of man and his environment. "Environments" can be regarded as regions when they exhibit roughly homogenous characteristics, and on the whole the smaller the region, the greater the number of conditions which are uniform within it. "Communities" of persons inhabit these regions—a community being a group of persons having certain characteristics in common, and again, the smaller the community, the greater tends to be the number of common characteristics. It is in the recognition of such geographical entities, and in the interpretation of the relationships between the physical features of a region on the one hand and the social, historical and cultural features of the community which inhabits it, on the other hand, that we find the proper scope for the geographer's activities. Although we may still argue as to what precisely constitutes a "region" or how we may define it, the basic conception of the regional idea, and the recognition of the fact that regional problems take their shape from the subtle relationship between natural and human forces, originates in the first instance from Mackinder's statement, and has been consolidated by a round half-century of his teaching.[2]

Recent views on the nature of geographical studies have expressed very much the same idea, in various terms.

The *Norwood Report*[3] announces in chapter 6 that geography implies the study of man and his environment, which really does not add very much to what Mackinder told us 57 years before. The late Mr. J. Fairgrieve provides a rather more imaginative definition:

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[1] Published in the *Proceedings of the Royal Geographical Society*, Vol. 9, 1887.

[2] See the bibliography at the end of this chapter for a selection of his papers.

[3] "Curriculum and Examinations in Secondary Schools", *The Norwood Report*, 1943.

"The function of geography is to train future citizens to imagine accurately the conditions of the great world stage, and so to help them to think sanely about political and social problems in the world around."[1]

This is a neat metaphor, of a stage on which the human drama is enacted day by day. And, Mr. Fairgrieve tells us it is our function to give an account of the *conditions* which are to be found upon this stage—presumably the more or less permanent geographical factors of physical structure, composition, distribution, climate and so forth—the many and various factors which go to make up the geographical setting. These are the conditions on the stage, but they are not enough, for there is no specific mention of the actors who play upon it, and it is most important to remember that men are very powerful agents in geographical change; they can both alter the conditions and are themselves in their turn profoundly influenced by them.

Any satisfactory definition of the nature of geography must take full account of this fact. There are many other definitions, as many as there are thinkers who express themselves silently in their books or vocally at their conferences. As an example we may consider one of them.

Professor Frank Debenham has recently marked the close of a long and distinguished career as a geographer by setting down in homely terms his views on the teaching of the subject. He notices that men have been learning at an alarming rate from the vast increase in knowledge of the nineteenth and twentieth centuries. But so far, what has been lacking is a unifying science which could satisfactorily interpret the findings of other sciences in so far as they apply to the surface of the globe on which we live. That, and nothing less, is the full task which Professor Debenham gives to the geographer:

(i) To interpret the facts of distribution
(ii) To correlate the life of man with his physical environment
(iii) To explain the interaction of human and natural agencies.[2]

There seem to me three reasons why this statement is so wholly satisfactory. In the first place, it preserves such a nice balance between the physical and the human aspects of geographical study. There is no emphasis on either of them but there is a simple recognition of the fact that in the synthesis which is geography, each has its appointed place.

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[1] J. Fairgrieve, *Geography in School.*

[2] Professor Frank Debenham, *The Use of Geography.*

Secondly, and arising out of the first point, there is an implied but discreet warning to the specialists to curb the exuberance of their personal enthusiasms, and if they are to remain geographers, not to trespass too far into alien, but allied, fields. It is perhaps pleasant to pursue a topic into geology, into meteorology, or into economics, but an excessive preoccupation with any one science and the department of geography which is closely associated with it, is to lose sight of the unifying purpose which is the principal characteristic of geography itself. Each one of these sciences, and many others, may provide the geographer with information which will help him to " interpret the facts of distribution ", or possibly to illuminate some other aspect of geographical knowledge, but there his interest in them should end.

Thirdly, this statement contains a timely and appropriate reminder that the most important duty of the geographer is to *interpret* what he sees. So long as geography consisted of a catalogue of factual knowledge to be memorised, or at the best a mere description of events, then it is not difficult to understand that the scholars at the turn of the century could see very little future for it as an intellectual study. And wherever the teaching of it remains in this form to this day, then it deserves no better treatment than it often receives at the hands of those who are concerned with education. If geography makes any claim at all to the dignity of an intellectual exercise, it is only in so far as it provides its students with opportunity for an intelligent appraisal of its content.

The scope of the subject then concerns the study of the surface of the earth and of the natural and physical forces which take place in it, on it, or around it, and the relationship between these forces and the lives of the men who inhabit it. In dealing with this material, one should be careful to avoid giving disproportionate prominence to any one aspect of it, either physical or human, and to recognise the fact that it is the *relationship* between the facts, rather than the facts themselves, which is the essential part of the study.

2. The Aim of Geographical Teaching

Why is geography taught? What object have we in view for the children in our charge? Is it because there are examinations to be passed, or because the subject happens to appear in the curriculum? Do we justify its position there because it contains useful knowledge? Because it makes for a better understanding between the peoples of the world? Or is it possible to look a little further and find out if it really makes any worthwhile contribution towards one's general education?

(I) USEFUL KNOWLEDGE

It is certainly useful to be well provided with geographical knowledge. The speed of events, the speed of travel, the obvious dependence of the nations upon each other—all these things make a study of geography useful if not quite essential. It is easier to talk intelligently about events as they occur day by day, when well informed. But we do not learn geography in order to be well informed on world events ; this is really putting the cart before the horse. Rather, an intelligent and lively interest in events as they occur provides an incentive to go and find out more about them, to absorb geographical knowledge, as it were, imperceptibly and incidentally. The cynic will tell us that the best teacher of geography is war, when everyone has an urgent interest in places far distant. "Useful" knowledge which enables us to keep abreast of the times certainly has something positive to offer to education. But it is not enough.

(II) BETTER UNDERSTANDING

Secondly it is suggested that a knowledge of geography makes for better international understanding and goodwill amongst men. Unesco have their publications[1] which emphasise this belief. The *Norwood Report* adds the weight of its authority in the phrase : "No one can realise more vividly than the trained geographer that the regions of the world are interdependent, and no one can base the approach to world harmony on sounder foundations."[2]

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[1] See for example : Unesco : Suggestions on the Teaching of Geography, *Towards World Understanding*, X, 1951.

[2] "Curriculum and Examinations in Secondary Schools," *The Norwood Report*, 1943.

These are no doubt laudable ambitions, and anything which will make its contribution to mutual understanding can be warmly welcomed in the education of children. But these are sobering thoughts in 1955 and " world harmony " now has a familiar and somewhat hollow ring. I do not suggest for a moment that if it seems to be elusive, then we should cease to search for it. Quite the contrary. But it is perhaps necessary to reflect that in spite of much excellent geography teaching in the schools and very much more popular knowledge in adult life over the last quarter of a century, the harmony we look for seems very little nearer. Knowledge (in this case geographical knowledge) is useful and very obviously it is easier to find solutions when we are equipped with it, than when we are left without it. But it does not of itself bring peace ; it may just as easily deepen intolerance. Teachers of geography might well be cautious of approaching their subject with a missionary zest which encourages them to believe that it is a part of their job to set the world to rights. Understanding and goodwill, good citizenship and the rest, do not necessarily arise from constantly impressing these virtues upon the children in the schools ; they are inclined to be impatient of over-much persuasion, and a teacher may well defeat his object by an excess of zeal. These admirable qualities are more likely to be acquired from the general tone of the school and the ethical standards which prevail within it.

(III) CONTRIBUTION TO GENERAL EDUCATION

The proper and legitimate contribution which geography has to offer to a child's education can only be considered in relation to the ultimate purpose of education as a whole. It is possible to spend much time trying to decide what we are educating *for*, but it is not always easy to decide. In the totalitarian state, the answer is clear ; it is to turn out individuals to a given pattern suitably indoctrinated with the proper beliefs. In a democratic community it is not quite so easy to be definite. We may be told that we are educating for citizenship, for leadership, for scholarship, for work or for leisure. There is no end to the list of things we are educating *for*, and they all imply that the educative process is primarily concerned with the *preparation* of children for something which is to follow in the future. This is no doubt true in a sense, but long-term projects are not always clear to children.

There is the danger that even the teachers may lose sight of the all important fact that education is concerned with the personal development of children which is taking place here and now. It is not so much a preparation *for* some aspect of life which has yet to come, as the fulfilment of their intellectual powers, whether they may possess these modestly or in abundance.

In practical terms, this means putting children into situations where they can learn, from subject matter which is full of meaning for them, and expressed in a language which they can understand. Some of the things which have the clearest meaning are those which capture the imagination and awaken the curiosity—the dramatic and astonishing things which take place in the world day by day. Many branches of science deal with these matters, geography no less than any of the others. Moreover, it offers its own distinctive angle on these exciting events and induces children to look further and further afield, and above all, to notice the relationships between the various facts which it offers.

Therefore I suggest that the study of geography is a profitable one for children, not so much because it prepares them for this or for that, but because it can provide them with stimulating material which has immediate significance, and because it offers opportunities for keen intellectual exercise in the pursuit of the significant relationships between the various parts of its findings.

3. How to Set about the Job

The method which a teacher employs depends upon the aim which he adopts. If his aim is to impart facts for some extraneous purpose such as the passing of an examination or the acquisition of a store of useful knowledge, then his method will consist principally of formal didactic instruction. But if his aim is to stimulate an enthusiasm for the subject and to lay firm foundations for personal study, then the cardinal principle of his method will be to demonstrate at every opportunity that geography deals with the realities of life as the children can see it round about them, and there will be far more opportunity for children actually to participate in the work which is done.

Where the first of these two methods is used exclusively, the facts learned soon disappear when the immediate need for them is passed. Moreover the sum total of facts which a child can learn during his school life is limited and this limit represents but a fraction of the body of knowledge which geography has to offer. Very much remains to be learned whether in the pursuit of a profession or merely as an enrichment of one's personal life, long after the guiding hand of the teacher has been withdrawn. So the incentive provided by the second method has far more lasting value, and children finish up, not only better informed, but better students since they have made first acquaintance with systematic personal study. This is not a new idea. Another glance at the 1880's will show that even then there were some few persons who were much concerned with the necessity of basing the study of geography on principles which were psychologically sound.

While gathering material for his report to the Royal Geographical Society on the teaching of the subject, Scott-Keltie was soon struck by the vigorous methods pursued on the continent. What he saw confirmed his own views which were always inclined to be progressive—" that children should be brought to realise the actual appearance of the various regions of the globe—their physical aspects, the vegetation which clothes them, the animals which roam over them, the people who dwell in them, the climate which dominates all. . . ."[1] He noticed the value of the simplest devices which help to add realism to the appreciation of landscape—the sand table for example—or an abundance of clear, lucid pictures. He understood the necessity for teaching children to *interpret* their maps. " In most cases ", he says, " map work is mere copying. In one well known school the map to be copied is placed on a sheet of glass behind which a fag holds a candle while the industrious pupil copies his exercise on a sheet of paper laid over his copy! "[2]

It is a little odd to reflect that although in 1885 Scott-Keltie had to record that the principal obstacle to an advance in geography teaching came from the geologists, and although Sir Archibald Geikie at one time stated that properly speaking geography was a branch of geology, yet the most powerful support for instilling reality into the teaching of geography came from Sir Archibald Geikie himself. In 1887 he published his little book *The Teaching of Geography* which set out so clearly the necessity for placing children into situations where they can learn at first hand. There is nothing which we have been told by the modern exponents of local studies, or of school visits, or of geographical field work, which had not already been laid down in principle by Geikie 67 years ago—"My object has been to indicate how, even amongst the youngest children, an intelligent interest may be awakened and stimulated in the world around them ; how they may be encouraged to look at things *with their own eyes* and draw from them their own conclusions ; and how in this way their conceptions of their immediate surroundings, of their own country, and of the whole globe, may from the very outset be made vivid, accurate and enduring."[1]

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[1] J. Scott-Keltie, " Report on Geographical Education," *Royal Geographical Society Supplementary Papers I*, 1885.

[2] ibid.

With humble acknowledgement to the master, our object is very much the same today even though this may not always be apparent in classroom practice, and though there may appear to be a marked preoccupation with knowledge to be learned and facts to be stored. How often have the same principles been re-echoed down the 60 years which have followed, and yet it is still possible to find intelligent children even in the upper forms of grammar schools for whom the bulk of their work consists of notes taken down from dictation.

I cannot stress too strongly that a teacher's philosophy should so direct his method that his children are actively engaged in *pursuing* knowledge instead of sitting and waiting for it to come to them. This means that he has to be enterprising in providing the necessary sources or pointing out where they may be found. He must be skilful in directing children how to make the best use of them, and vigorous in his own personal teaching. I hope to translate this into practical terms in the chapters which follow.

For the present I should like to add just one word of caution on the interpretation to be placed on the term "actively engaged". This does not necessarily imply activity in the physical sense, nor an excess of exuberance or informality. As I understand it, children are actively engaged if they are intelligently occupied on any sort of occupation which happens to be appropriate for the task. A class of young children busily engaged upon some communal undertaking which involves a certain amount of movement as well as thought, is "actively engaged". But so also is a sixth form listening intently to a discourse from a learned speaker, and subsequently engaging him in his arguments. This class, too, is "actively engaged" even though the activity is almost wholly intellectual. There are times when either or both types of activity may be appropriate, and it is important to remember that "activity" in this sense ought always to be present even in the ordinary lesson which forms the greater part of daily routine.

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[1] Sir Archibald Geikie, *The Teaching of Geography*, 1887.

The success of a method is reflected in the attitude which children bear towards the subject after they have spent some time at it. I do not suggest that they must become parochial towards it to the exclusion of other interests, acquiring what is sometimes described as a *geographical attitude*. Indeed, I am not quite sure what a geographical attitude is. It is easier to understand an *enquiring* attitude which helps a pupil to seek and find, or an *enthusiastic* attitude which serves him as a powerful incentive, or a *scientific* attitude which enables him to seek his facts and to reason about them when he has found them. Any one of these attitudes may serve a pupil well in the study of geography and conversely, when the subject is well taught, it is probable that they are actively encouraged. It is also probable that such attitudes may apply to other subjects as well, and habits of work thus become established. The arguments surrounding formal discipline seem to suggest that a skill acquired in one subject is not necessarily carried over to another. But it appears more evident that attitudes and systematic habits of study are more general in their effect. These things are the things that endure, and if they are established aright from the beginning, and the children can say: "We have enjoyed doing this; let us find out more about it"—then something really positive has been achieved, a stimulus has been given, and facts soon follow.

There is powerful support for this argument in the words of Sir Cyril Burt who has said: "We have come to the conclusion that it is the less tangible elements of education—*attitudes, ideals* and *enthusiasms* that tend to persist rather than factual content Thus a course of study is to be judged by the extent to which the interests and the enthusiasms of the children are stimulated, rather than by the number of items memorised and absorbed."[1]

THE GEOGRAPHICAL ASSOCIATION

In this brief review of geographical thought and practice, it is proper to consider the notable part played by the Geographical Association in the evolution of ideas. To do this we need to go back yet again to the turn of the century, shortly after Mackinder was appointed Reader at Oxford. The conception originated in the mind of a master at Rugby—Mr. B. B. Dickinson. Being a particularly enterprising teacher he conceived the idea of an interchange of lantern slides between those few teachers who taught geography. He wrote to the Royal Geographical Society about this, and so came into contact with Mackinder. A meeting was arranged to discuss an exchange scheme, at Christ Church in 1893. Mackinder and ten other public school masters were present. From the rather limited topic of the use of the lantern, the larger notion embracing the whole of geographical teaching quickly captured the imagination of those present and there and then the decision was taken to form an association devoted to the cause of geography and its teaching. The first meeting was held in 1894. Fifty members were present. From the first, support was lent by the Royal Geographical Society in the persons of Douglas Freshfield and H. R. Mill, then secretary and librarian of the Society respectively. Originally, membership was confined to schoolmasters in the public schools, but later teachers of geography in any school, and indeed any others who might be interested, were admitted. Membership rose to roughly a thousand before the first war, and four thousand before the second. There are now some forty-five branches in various parts of the country.

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[1] Sir Cyril Burt, writing in the foreword to *Social Studies* by James Hemming.

The object of the Association was established in the very first circular published in 1894, as being the improvement of the status and the teaching of geography in the schools, and the encouragement of any methods of teaching which tend to the comprehension of geographical principles rather than isolated facts. This appears again in the first number of the journal of the Association, *The Geographical Teacher*, 1901. There is an introduction written by Douglas Freshfield, then President of the Geographical Association, to launch the new publication on its way. In it he says "Our object is to enforce the place and importance of geography, not only as a body of facts or proper names, but as an educational discipline and an element of general culture. In short, we desire to answer in the affirmative the question addressed to the present writer by Dr. Jowett while Vice-Chancellor of the University, 'Can you teach geography so as to make people *think*'?"[1] If we recall the occasion of the origin of the Association, and if we reflect on the achievements of some of the illustrious names connected with it in those early days, it is not really surprising that the Association originally stood for (and indeed it still does), a more liberal conception of the nature of geography and for the most enterprising interpretation of its use. Students of this subject who may seek for guidance as to the true meaning of geography cannot do better than to refer to the stimulating Diamond Jubilee Address delivered by Professor Debenham on the occasion of the celebrations at Sheffield in September 1953.[1] They will find there much that does not normally appear in the textbooks, but they will be left in no doubt as to those qualities and the attitude of mind which are the marks of the geographer and which it is the teacher's duty to foster among those of his pupils who would study the subject.

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[1] Douglas Freshfield, writing in the introduction to Vol. 1 of *The Geographical Teacher*, 1901.

The Association now has its headquarters at Sheffield where it offers a comprehensive service to teachers through its various functions.[2]

CONCLUSION

I conclude this chapter by summarising some of the principal points which have emerged in it.

First, in deciding the nature of the subject, a teacher should not lose sight of the fact that the function of geography is to provide an overall view of those natural and physical events which take place on or around the surface of the earth, including the lives of the men who live on it, with a distinct emphasis upon the relationship which exist between these various forces. Thus it is not so true to say that the earth is studied as the home of man as it is to say that he studies the earth, and all the different modifying agencies which go to make up its regional patterns, man being one of these agencies working in conjunction with the others, or sometimes in opposition to them.

Secondly, in dealing with this material, the aim is not so much the acquisition of factual knowledge as the development of an enthusiasm for the work, an insight into the knowledge which geography has to offer, together with a wider contribution to the general education of children in the shape of a positive attitude towards work and the development of sound habits of study.

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[1] Professor Frank Debenham, " The Diamond Jubilee Address," Geography Vol. 38, Part 4, November, 1953.

[2] See Appendix 4.

Thirdly, these aims are more likely to be realised when the children are familiar with the fundamental principle that geography deals with realities rather than academic abstractions, and when they are given opportunity in their own personal study to pursue knowledge and to use it intelligently when they have found it.

THE GEOGRAPHER'S METHOD OF WORKING

If we set out to develop in children the urge to be geographers (in however modest a fashion) it is at least fair to equip them with the means, namely, a knowledge of the sources where geographical information is to be found, and a knowledge of the methods used to extract it. The characteristic way of working may be taken as :

(i) To observe, or to seek information
(ii) To record what has been found
(iii) To reason about these observations and to draw relevant conclusions from them.

It is then the teacher's function to direct this process—to make the sources available and to show children how to use them ; to instruct in the most appropriate method of recording ; and finally, to direct the interpretation, to point out obvious relationships and the conclusions which may be drawn from them, and so to train children to make their own.

The first two processes in this sequence come quickly ; the third, and the most important, demands intellectual application and may have to wait a little longer. Not all children will run the full course ; but that is no reason why they should not be taken along it as far as they are able to go ; relationships can be noted and conclusions reached either at an advanced or at a modest level according to the intellectual equipment of the children. This third and very vital stage should always be the aim of sound geography teaching ; one should never be content to remain at the first.

BIBLIOGRAPHY

Sir Archibald Geikie, *The Teaching of Geography*, Macmillan, 1887.
H. J. Fleure, *The Geographic Background of Modern Problems*, Longmans Green, 1932.
F. Debenham, *The Use of Geography*, English Univ. Press, 1950.

S. W. Wooldridge and W. G. East, *The Spirit and Purpose of Geography*, Hutchinson, 1951.

J. Walker, *Some Aspects of Geography Teaching in School*, Oliver and Boyd, 1953.

Unesco, *Memorandum on the Teaching of Geography*—VII, Unesco, Paris, 1950.

Unesco, *Suggestions on the Teaching of Geography*—X, Unesco, Paris, 1951.

Board of Education, *The Education of the Adolescent* (Hadow Report), H.M.S.O., 1926.

Board of Education, *Secondary Education* (Spens Report), H.M.S.O., 1938.

Secondary Schools Examination Council, *Curriculum and Examinations in Secondary Schools*, H.M.S.O., 1943.

Sir Halford Mackinder, *The Content of Philosophical Geography*, Proceedings of The International Geographical Congress, Cambridge, 1928.

ROYAL GEOGRAPHICAL SOCIETY PAPERS

J. Scott-Keltie, Report on Geographical Education, *R. G. S. Supplementary Papers*, 1, 1885.

Sir Halford Mackinder, The Scope and Methods of Geography, *Proceedings of R. G. S.*, Vol. 9, 1887.

A. J. Herbertson, The Educational Applications of Geography, *Geographical Journal*, Vol. 24, 1904.

Sir Halford Mackinder, Geography as a Pivotal Subject in Education, *Geographical Journal*, Vol. 57, 1921.

E. G. R. Taylor, Richard Hakluyt, *Geographical Journal*, Vol. 109, 1947.

S. W. Wooldridge, Geographical Science in Education, *Geographical Journal*, Vol. 109, 1947

J. N. L. Baker, Mary Somerville and Geography in England, *Geographical Journal*, Vol. III, 1948.

J. F. Unstead, H. J. Mackinder and the New Geography, *Geographical Journal*, Vol. 113, 1949.

L. Brooks, Geography Teaching in School, *Geographical Journal*, Vol. 119, 1953. Also in the Proceedings of the International Geographical Congress, Washington 1952.

PAPERS IN *Geography*

(Before 1926, known as the *Geographical Teacher*)

Sir Halford Mackinder, Geography in Education, Vol. 2, 1903.

Sir Halford Mackinder, The Development of Geography Teaching out of Nature Study, Vol. 2, 1904.

TRAINING CO BANIPUR

J. F. Unstead, The Meaning of Geography, Vol. 4, 1907.

Sir Halford Mackinder, Presidential Address to the Geographical Association, Vol. 8, 1916.

H. B. Hodgson, Notes on the History of the Teaching of Geography, Vol. 22, 1937.

J. Fairgrieve, Can We Teach Geography Better?, Vol. 21, 1936.

C. C. Carter, The Creed of a Teacher, Vol. 25, 1940.

Sir Halford Mackinder, Geography, an Art and a Philosophy, Vol. 27, 1942.

S. W. Wooldridge, On Taking the " GE " out of Geography, Vol. 34, 1949.

E. W. Gilbert, The Seven Lamps of Geography. An appreciation of the teaching of Sir Halford Mackinder, Vol. 36, 1951.

O. J. R. Howarth, A Survey of the Present Position of Geography in School, Vol. 38, 1953.

H. J. Fleure, Sixty Years of Geography and Education, Vol. 38, 1953.

F. Debenham, The Diamond Jubilee Address delivered to the Geographical Association at Sheffield in September, 1953, Vol. 38, 1953.

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SECTION II

Local Observations and the Use of Maps

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CHAPTER 2

BEGINNING AT HOME: AN INTRODUCTION TO GEOGRAPHY WITH YOUNG CHILDREN

Anything that is alive is far more interesting than anything which is only pretending to be alive.
G. B. SHAW

IN the first chapter I demonstrated that a teacher's principal concern in teaching geography is to make quite sure that his pupils understand geography as a study of living things—of people who live and of landscapes which actually exist.

I have shown that this is not a new idea. Enterprising teachers long since came to the conclusion that children possess a lively if latent interest and curiosity for what they can see around them. They learn best from those things which capture their imagination. If this principle is applied to the first steps of geography teaching, it means that we must begin at home with a study, however elementary, of what the immediate neighbourhood has to offer. Children are then taught from the first to understand that geography deals with real life and that knowledge learned from it has genuine significance—" a fact discovered by a child for himself through his own direct observation becomes a part of his being and is infinitely more to him than the same fact learned from hearsay or acquired from a book."[1]

Therefore the responsibility lies heavily on those who teach the younger children. For upon the spark which is kindled at this time will depend the enthusiasm (or the lack of it) which children feel for the subject, their attitude towards it and their proficiency at it later on in school life. Young children who have been brought up accustomed to seek and find at their teacher's direction have at least made a beginning in working geographically.

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[1] Sir Archibald Geikie, *The Teaching of Geography*, 1887.

Observations by Children

Observations made by very young children are necessarily limited. On the other hand it is remarkable how penetrating intelligent children can be when once their curiosity has been given that initial impetus by a teacher who is himself enthusiastic for this kind of work.

Work in the local district is often confined to social observations of a somewhat superficial character which fail to stress the importance of maintaining a geographical emphasis. From the geographer's point of view human activities are necessarily related to, and frequently derived from, the physical structure of the region. Therefore observations of natural features of a simple kind should be undertaken first as for example, the shape of the ground : some is higher, some lower ; some hills are steeper than others ; some are exceedingly steep, some indeed are *cliffs* or *escarpments* and these terms are introduced naturally into the working vocabulary when such features are observed along with other simple descriptive terms such as *hill*, *knoll*, *ridge*, *valley*. It does not take long to notice that water runs down these hills and not up ; that it tends to collect in *streams* which join together as *tributaries* to form *rivers*, some of which run more swiftly than others ; and generally speaking the swifter running streams occur where the slopes are steep whereas broad sluggish-flowing rivers *meander* slowly across the plains below. It is perhaps possible to trace a *tributary* back to its *source* if it is within reasonable distance, and then another fact will emerge—that *springs* flow more freely at some times than they do at others. It is but a step to relate this to the weather observations which the children keep recorded on a chart in the classroom and to the fact that prolonged rain, free-flowing springs and floods in the lower valley occur together, whereas prolonged *drought* goes with restricted or intermittent flow and parched fields.

In these elementary observations the pupils have made a beginning in the study of physical geography not *in vacuo* but from living samples in their own neighbourhood. They have taken new words into their geographical vocabulary, not in a sterile list, but quite naturally and incidentally as the occasion demands them.

Another very simple but quite fundamental physical feature to notice is the colour of the sub-soil. It may be exposed to view in cliffs, railway cuttings, quarries, gravel-pits, or simply in trenches dug in the road for repairs to cables or watermains. It may be red and somewhat sticky as in the case of Keuper marl; or white and very hard on the chalk; yellow in the Cotswolds; black in the Fens. These differences in colour and texture are important as the children will see when they pass on to the next stage in their observations—the life and work of men. What use have they made of the land? Is it agricultural? If so, what sort of agriculture is practised? Is it industrial? Are there coalmines, brickfields, quarries or gravelpits in the neighbourhood? What of the roads and the railways—how do they avoid or overcome natural obstacles such as the steepest hills, or rivers, or land liable to floods? These and similar questions soon capture the imagination of children and the material which they discover is invaluable as a starting point for further studies. But more important than this, children so trained are learning to *open their eyes*, to see that the neighbourhood will disclose a wealth of interesting matter if only they know how to look for it.

Another aspect of method shown here is the fact that we have begun to teach physical geography by using real examples—the simpler land forms which can actually be seen. This is a principle which may well be continued whenever physical geography is dealt with. I regard this as most important, for so often the teaching of physical geography and of land forms in particular, is done from models of hypothetical examples with impeccable symmetry, divorced from their context and which bear little relationship to living features. In my view it is most necessary for children to understand from the beginning that physical features are not isolated elements which stand alone and that one does not build up a landscape piece by piece by adding together so many separate components like the bits of a jig-saw puzzle. Rather they should learn that a landscape is an entity of itself with its own individuality and that it contains certain distinctive features. It is convenient to call these features by specific names, on occasions to isolate them temporarily and to simplify them by means of diagrams or models so that their shape may be observed or their evolution more closely studied. (See for example, Fig. 55, Chapter 8, Section 4). It is legitimate to do this when the features are taken from the landscape for examination and " put back " as it were, afterwards. But it is misleading for children and gives them a wholly wrong impression of physical geography when the "bits" are taken first and added together afterwards.

Using local material in this manner is not always easy. In the first place varieties of topography or of physical structure do not always occur within the immediate neighbourhood. Some areas are rich in potentialities, others more uniform, offer less scope for a study of the physical background to man's life and work. This is particularly true in towns where physical structure is so masked by building. Further, it is rarely possible in the time available, frequently to take whole classes out of school to make such observations. There are many other things to be done and school life is short. In any event there is no reason why forty children in a body should be engaged in school hours on a task which a couple could do equally well in their spare time. Instead, after the teacher has drawn attention to the possibilities inherent in their surroundings, a more practical arrangement is for individual children or pairs of children to go out, observe, and record their observations. Later, they place their results before the remainder for more systematic study in class. It is well to set definite limits to such an enterprise and to lay down beforehand precisely what is to be looked for.

WITH THE SCHOOL AS A CENTRE

As an example of the kind of work which can be done locally with young children, a series of four journeys can be arranged going in each direction from the school, north, south, east and west for as far as children can conveniently walk in an hour. Four pairs of children undertake these journeys in their own time. They are instructed to observe according to a schedule drawn up with the class before they go out, e.g. Starting from school, walk to the *west*[1] along Scardale road for about an hour:

(i) How far do you go?
(ii) Do you go uphill or down?
(iii) Is the hill steep? Can you see any steeper?
(iv) As you go, do you see on the road sides: houses, or fields? Or any of these: a colliery, or a gravel-pit, or a brickworks?
(v) Is there anywhere on the journey where you can see the

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[1] Or to the north, or south, or east for other parties.

soil exposed? What colour is it? Is it sticky, or hard or soft? Bring some back.

(vi) Do you cross, or can you see, any rivers? etc., etc.

There are similar instructions drawn up according to the detail which the teacher knows is likely to be met, for the parties which set out from the school to the east, to the north, and to the south. With the school as a hub, these four parties go their separate ways for an hour, each covering approximately a mile and a half.

They observe and record what they see. They may illustrate with a little sketch map which again is a matter for specific instruction from the teacher. I emphasise this matter of instruction. Local study can so easily degenerate into aimless wandering, wasting much time and energy from lack of a little direction beforehand. It should always be borne in mind that schools are places where work is done, and the teacher's first task is to direct it.

Subsequently the reports are presented to the class.

Examples of Reports

FROM THE FIRST PAIR TRAVELLING WEST

" We walked from school on Saturday morning. It is downhill going down Scardale Road towards town. There are houses on both sides. There is a space between the houses and tall chimneys behind. We went in to see. There is a deep pit where clay is dug out. The clay is dark red. We brought a lump back. Further down the road there is another pit, and more chimneys where they make bricks. Further on it is uphill and steep. On the right-hand side of the road it is very steep. There are no houses because it is so steep. We went up to see. There is a red cliff, soft and crumbly. There are gullies worn in it where boys slide down on their heels. We slid down. At the bottom there is deep red soil where it has come down from the cliff. We walked on. On the other side of the hill there were men digging in the road. The soil in the hole is not red any more. We put some in a tin. Further on there is a steep cliff of grey rock."

FROM THE SECOND PAIR TRAVELLING SOUTH

" We went from school the way we were told, on Sunday. There are houses at first, but further on it is open. It stands high above the river, and we can see for a long way over the river. At the edge it drops down steeply on the other side of the fence. There is a railway below. You can look down on top of the engines. The soil on this cliff is red and it crumbles. We put some in a tin. You can see over the racecourse towards the river where it is very flat. We went down a path. We crossed the railway by the level-crossing and the road, and went to the river. It is shallow there and men stood in the water fishing. We paddled over. The river runs in a big curve, like this (Fig. 1). Further on there is another curve and now it looks like this (Fig. 2). There is a canal on the other side of the field, joining the curves together. We saw a crane in a field and went to see. There is a deep gravel-pit with cranes, and full of water. There were red and yellow lorries going away full of gravel and dripping with water."

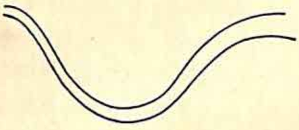


FIG. 1

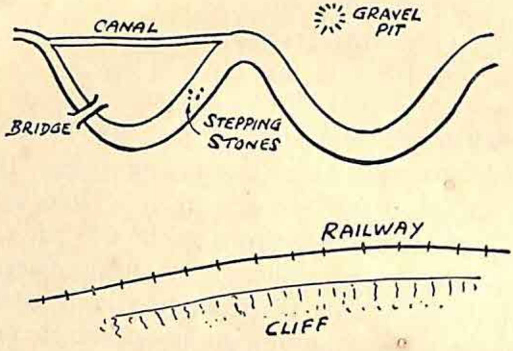


FIG. 2

There is a good deal of information to build on in these two rather superficial explorations. In the first there is the difference between sandstone and clay and between different kinds of sandstone. Weathering is noticed on the sandstone cliffs, for the gullies were not sculptured entirely by the heels of small boys. It is probable that they were eroded first and that the boys were quick to see the obvious use for these natural slides. The hills are seen to be of different slopes and shapes, two of them being so steep that they form cliffs and one a formidable bluff. Clay pits and brickworks are noticed on the Keuper marl.

On the second journey the explorers emerge on the edge of an escarpment overlooking the flood plain of the river below, a vantage point which local people are quick to use on race days for it commands a fine view of the racecourse spread out like a map below. From this point many years ago it is probable that local folk would look with apprehension for the coming of the Angles and the Saxons and later, the Danes, for the river was certainly the principal highway in those days. There is historical as well as geographical knowledge to be noticed here. The racecourse has its own interest. It contains a " straight mile " marked off conveniently for the first half-mile by starting gates at furlong intervals, like a gigantic plain scale, full size. The whole of it is visible from high up and it gives a clear impression of what units of distance actually *look* like on the ground.

Here also the boys notice the road and railway clinging close to the foot of the hill, avoiding the hill itself and at the same time keeping a safe distance from the river which is here liable to flood. They notice the meanders, and when closer at hand, the artificial channel which has been cut across for river traffic. The presence of the gravelpit in the river gravels is as significant as the clay pit which their friends saw on the Keuper marl.

In the meantime, other parties of pupils on the northward and eastward journeys have seen a very different picture. From the north they will report a country of coalmines, pit mounds and slag heaps. To the east, houses are soon left behind and the children find themselves in the valley bottom, a fertile country of marl and alluvial flats given to market gardening and dairy farming, the natural choice near to a large industrial town which offers a ready market and quick returns on perishable products.

All these things have been seen. It is now the teacher's function to explain, to elaborate and expand them into new conceptions which can be accepted easily and naturally because they are real. He should now systematise in his more formal teaching the somewhat haphazard information which has been brought in. These are the things which are of geographical significance. Obviously they do not exhaust the locality. It is not intended that they should. On the contrary the intention is to provide a stimulus for other children to make the same or similar journeys and to keep their eyes open while doing so; to make them aware of the possibilities and of the method. A succession of short journeys at suitable intervals by individuals or small groups in their own time can keep up a constant supply of fresh information for use in class. This practice is simply a matter of encouraging children to keep their eyes open as they move about their own neighbourhood. It is quite informal. The only organisation required from the teacher is that he knows what the district has to offer and consequently he can tell the children what to look for. It is as well that this direction should come subtly from the background so that the children may feel that they are making discoveries for themselves. In some schools, "Explorers' Clubs" or "Discoverers' Clubs" are organised to canalise these activities arising from the natural curiosity of small children. To be admitted, one has to "discover" some item of knowledge for oneself and subsequently, status is achieved in the club by further discoveries of a more ambitious nature.

Of course there are many other ways in which local material may be used. Many teachers prefer to make fewer journeys but with larger numbers, conducted personally by themselves and in school time. In this case the activities are more closely directed and very profitable if they are properly prepared beforehand. It is possible for the teacher to point out on the spot significant features which might otherwise be missed. On the other hand large parties are rather less mobile and timetable difficulties are more acute. If there is a local vantage point which commands a good view, a visit to it is a great help in visualising the form of the landscape or the pattern of the neighbourhood. Other visits reveal from close at hand the life of the neighbourhood. Alternatively it is often more convenient and a great saving of time to bring Mohammed to the mountain; local personalities can come to the school and bring their specialised knowledge—and their personalities—with them. A suitable selection of those who serve the public or representatives of local trades or occupations can be chosen to add colour to local study; they supply too, that touch of personal contact which is so valuable.

Even so, there is a great deal in local geography which is quite beyond the capabilities of children of eleven years of age. Moreover they must have the chance to look to other lands, since their imagination is vivid and is readily captured by the more exciting

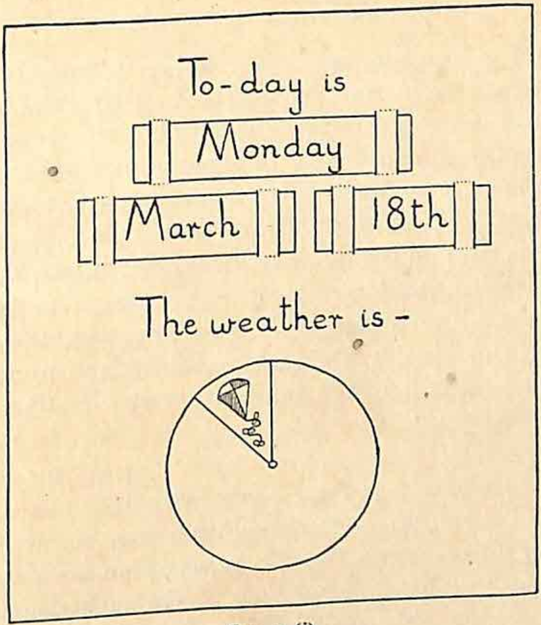
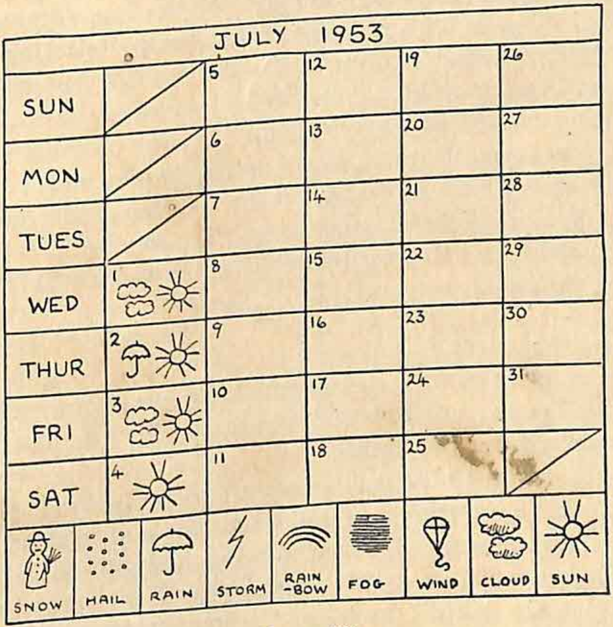


FIG. 3 (i)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WED	1 ☁ ☀	8	15	22	29
THUR	2 ☂ ☀	9	16	23	30
FRI	3 ☁ ☀	10	17	24	31
SAT	4 ☀	11	18	25	

FIG. 3 (ii)

and colourful events that take place far away from home. For these reasons it is sometimes preferred to leave local work until later on in the secondary school, when children are old enough to understand more easily the rather complex relationships of social and economic life, mature enough to work on their own, and when they are rather more robust and can undertake more tiring and ambitious work in the field. Older children too, look at their world with more critical eyes for they are nearer to taking their own place in it. For children of fourteen, the neighbourhood can become the focus for projects on local life or institutions. Later still, it is the proper field for modest research for those who are intellectually capable of it.

OBSERVATIONS OF WEATHER AND SUN

There are other things which children may see without even moving from their school. Weather observations in a simple form (as in the chart at Fig. 3) are some of the earliest geographical recordings possible. Measuring the shadow of a post set-up in the playground at intervals during the day quickly draws attention to the apparent path of the sun in the sky. If these measurements are repeated at the solstices and at the equinoxes the relationship that exists between the sun's altitude, the duration of day and night, and seasonal variations in the weather will very soon be established. Direction is learned by observing the shortest of these shadows at noon, and opposite to it, the direction which never has any shadow at all. These topics and many like them, are dealt with very much more fully in chapter 7. For the present they are noted in passing as being very suitable for observation at first hand by young children.

LOOKING FURTHER

To be acquainted with and interested in the geography which lies round about is an admirable beginning, but it is not enough. It is not enough for two reasons.

In the first place, children at the age of 9 to 11 years are consumed with curiosity, very critical of and impatient with restrictions on their own zeal. For them the world is beginning to be an exciting place. Events move so swiftly nowadays. The speed of aircraft and " round the world " broadcasts bring remote places near to hand. New things are opening up each day, new names, new places, new people. It is small wonder therefore that the answers to their interminable questions " where? " and " how? " lift their eyes up to look very much further afield and at an earlier age than formerly. A knowledge of one's local district is very modest fare for an imagination which is already beginning to roam the globe. The natural urge to find out more must be met with opportunity to learn of the wider world outside.

Secondly, it is argued that by the end of their primary school career, children ought to be in possession of an adequate working knowledge of geography which serves as a foundation on which the secondary schools may build. To a certain extent this is true, but it can never be wholly acceptable, for it implies that the principal function of the primary stage of education is to prepare for the secondary stage which follows, and I find this difficult to accept. We can spend so long at any stage preparing the way for some future event which has yet to come, while we lose sight of the fact that the proper purpose of education is to cater for the needs of the children *at the moment*. Thus the primary school becomes an integral stage in a continuous process of educational development, a place where each child finds the *opportunity* and the *incentive* to develop his own abilities to their fullest extent. Whichever of these two interpretations of primary education we may accept so shall we determine the work which is done inside the schools and the methods employed to do it. If we choose the first, then the method is more likely to be formal didactic instruction. If we choose the second, then there will inevitably be a greater measure of informality, of choice, of movement, and of purposive activity in the schools. While I feel this choice to be the right one, there must at the same time be considerable sympathy with those secondary school teachers who find children of roughly comparable ability coming up to them with such marked variation in their attainments. It is not unreasonable to expect that in addition to the enquiring mind, the lively interest and the factual knowledge gleaned from local studies, a child should also have acquired by 11 years of age, at least an introductory knowledge of the life and work of selected people overseas, the names of the countries in which they live, the names and locations and the shapes of the continents which contain them, the names of the oceans which surround them, as well as a working knowledge of some of the commoner geographical terms in frequent use. This may sound suspiciously like a "basic vocabulary" which is learned by rote after the fashion of fifty years ago and any such suggestion should be carefully avoided. By all means let us memorise the facts *after* they have been discovered in a manner which maintains the principle that geography is a study of things as they really exist.

Probably as good a method as any, and one which has proved to be effective, is to establish a link between the neighbourhood and the world outside. This link with other countries which have a distinct relationship with the needs of local people, can be established from a scrutiny of the shelves of the grocer's, or the greengrocer's, or the butcher's shop. A list of items of food and drink and other necessities well known to the children can be quickly prepared from a survey of the shelves by one or two children, in the same way as they carry out their survey of the neighbourhood. In this case, as before, they will collect their information according to a schedule previously prepared. Foods for instance, can be divided into grain foods, fruit foods, vegetable foods and meat foods; drinks into the "hot" drinks such as tea, coffee, and cocoa, and the "cold" drinks such as wines and beers. Possibly hot drinks alone will be sufficient for their purpose at present. Clothing will give us wool and cotton, and so forth. Labels and cartons are collected, lists are prepared, illustrative displays are arranged;[1] and from this background the teacher's systematic instruction on a selected number of appropriate topics is built up. A selection must be made which serves the immediate purpose and that is to give the children a broad picture of the countries of the world and of the people who live in them. For each commodity chosen the teacher's instruction will provide the names of the countries where it is produced and a knowledge of the people who produce it, their appearance and dress, the climate they live in, their habits, life and work. These are the things which appeal most readily to young children. Personalities, particularly vigorous and colourful personalities, are far more attractive to them than austere geographical facts. Maps will be made of these things and the picture of the world broadly sketched, but the focus of it all is upon the people who live work and have their being in the different parts of it and who, incidentally, stock our shops with food and drink.

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[1] See Chapter 8 Section 4.

CONCLUSION

In the beginning geography must be made to live, and children to open their eyes. Otherwise the subject remains but an academic routine and children will go for years without even being aware of the simplest things which lie before them, without even knowing whether they are walking uphill or down, or where the main road goes to, whether it goes under or over the railway or why it does so. Without knowing where the stream comes from or where it goes, without noticing whether it runs full between its banks or trickles thin along its bed in time of drought; it means little to them. Without noticing which way the sun casts its shadows, or what lies behind the hedge. For many children the horizon lies at the end of the street; what happens beyond is in another world.

It is to dispel this insularity, to add some purpose to the empty hours, to illuminate the world outside, the world of newspaper headlines, of wireless broadcasts and great events, that living geography can be of use.

In subsequent chapters I hope to show that once established in the primary school this principle can profitably continue, adding zest and vitality to the study of geography through the secondary school.

BIBLIOGRAPHY

E. Layton and J. B. White, *The School Looks Around*, Longmans Green, 1948.
M. V. Daniel, *Activity in the Primary School*, Blackwell, 1947.
T. H. Etherington, *In and Out of School*, Pitman, 1950.
H. C. Barnard, *Observational Geography and Regional Survey*, Le Play, 1935.
C. A. Simpson, *The Study of Local Geography*, Methuen, 1950.
C. A. Simpson, *Making Local Surveys*, Pitman, 1952.
Olive Garnett, *The Discovery Books*, Blackwell, 1950.
Geographical Association, *Geography in the Primary School*, 1953.
Geographical Association, *Local Studies*, 1949.
Ministry of Education, *Local Studies*: Pamphlet No. 10, H.M.S.O., 1948.
Consultative Committee of the Board of Education, *Report on the Primary School*, H.M.S.O., 1931.

ARTICLES IN *Geography*

E. Smith, Field Work in Town Schools, Vol. 4, 1907.
C. B. Fawcett, Suggestions for the Study of Local Geography, Vol. 7, 1913.

H. J. Fleure, Regional Surveys in Relation to Geography, Vol. 8, 1915.

L. Winchester, The Teaching of Geography to Little Children, Vol. 8, 1916.

T. T. Gray, Experiment in Regional Survey in an Urban District, Vol. 14, 1927.

H. Ormsby, Regional Survey in a Large City, Vol. 14, 1927.

E. Walsh, An Experiment in Local Study, Vol. 30, 1945.

C. A. Simpson, A Venture in Field Geography, Vol. 30, 1945.

H. A. P. Jensen, The Promotion of Field Studies, Vol. 31, 1946.

B. B. Bartlett, Approach to Geography through Local Survey, Vol. 33, 1948.

H. R. Lyons, Local Geography in a Grammar School, Vol. 34, 1949.

E. W. H. Briault, The Study of Local Geography as an Integral Part of the School Course, Vol. 38, 1953.

A. Coleman, Field Work in Schools, Vol. 39, 1954.

Article in *Visual Education*

F. Tyrer, Local Material for Local Studies, November, 1951.

CHAPTER 3

THE FIRST STEPS IN MAP WORK

> We may begin with the very first step in geography—how to record where a thing is. PROFESSOR FRANK DEBENHAM

In the first chapter I referred to the geographer's characteristic way of working which is to observe, to record and to reason. There followed certain suggestions showing how the habit of observation might be encouraged in young children with a view to making their geography a living thing.

While this is being done the need for recording observations becomes apparent and one of the most lucid and convenient methods of recording geographical information is in the form of a map. This does not suggest that other ways cannot be used nor that children should be inarticulate in the use of language, but it does mean that facility with maps, the ability to make them and to read those which have already been made by other people is quite fundamental in the study of geography. Nearly all geographical information—Mr. Fairgrieve says 90 per cent[1]—can be put on a map. Many years ago Rudyard Kipling remarked that as soon as men begin to talk about anything that really matters, someone has got to go and get an atlas. Almost any subject can be discussed more intelligently if one is well informed about the element of "whereness" which is inseparable from it, whether it is the international situation, or the price of food, the stirring events associated with M.C.C. tours in Australia, or the migration of professional footballers to sporting clubs in South America. In view of the importance of *Place*, and of the relationship between one place and another, Professor Debenham has made his enterprising and picturesque suggestion that in every public bar in this country there should be an atlas printed on paper resistant to beer stains,[2] the inference being that the question "where is it"? inevitably occurs at some time in every argument. Perhaps there is small comfort in this for the schoolmaster but the same principle may well be followed by him, and whenever a geography lesson is in progress atlases should be open on the desks, ready for use. This implies that children know how to use them properly, so it might be as well to give some thought to the development in children of what we might call " map consciousness ", that easy familiarity with maps which is achieved when they have come to regard them as their natural medium and which is the result of having been accustomed from the first to making maps for themselves. Children so trained can be made fully conversant with the specialised language which maps employ, consequently they have no difficulty in interpreting their meaning.

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[1] J. Fairgrieve, *Geography in School.*

[2] Professor Frank Debenham, *The Use of Geography.*

The developing process of map usage appears to have three stages :

1. *Map spelling*, corresponding roughly to the map work which is done in primary schools, up to 11 years of age.
2. *Map reading*, the use of maps by children in secondary schools at levels which become increasingly more difficult between 11 and 15 years of age.
3. *Map interpretation*, which is undertaken when a pupil has become familiar with the mechanics of map reading, and when he is intellectually mature enough for relational thinking of a high order. Therefore as a " stage ", this will appear in the fifth and sixth forms, but it should be remembered that at *every* age, children ought to be encouraged to look for significance in what they see, in so far as they are capable of it.

1. MAP SPELLING

This is not necessarily the happiest term but it is intended to represent the very first stage in map work when children are concerned with learning the very elements of map language such as the signs, the letters, and other devices used to record information, the habit of employing a scale to represent ground distance, the direction of the landscape which the map stands for, in short, much of the information which is customarily found in the margins of the maps of the ordnance survey and in the key or legend of maps found in atlases and textbooks. These elements may be regarded as the " alphabet " or the components which go to make up the language. As with any other alphabet it is best learned by use, so the "map spelling" stage would consist of the children making their own maps and learning the first principles as they do so.

THE FIRST MAPS

The first map represents a situation which a child can see before his eyes—a book, or a box of crayons, or some other object placed upon a desk. The instruction is simply to draw a picture of it on a piece of paper (Fig. 4). The result is crude, the corners are not

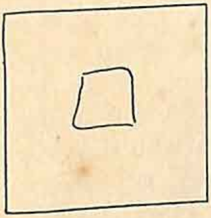
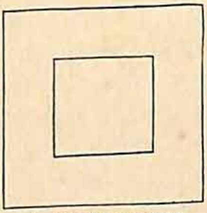
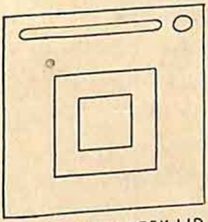


FIG. 4



A MAP OF MY BOX

FIG. 5



A MAP OF MY DESK LID

FIG. 6

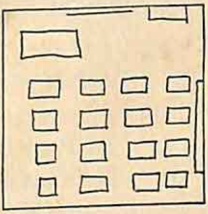


FIG. 7

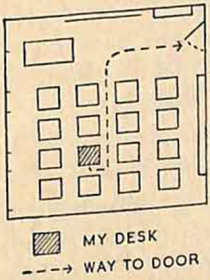


FIG. 8

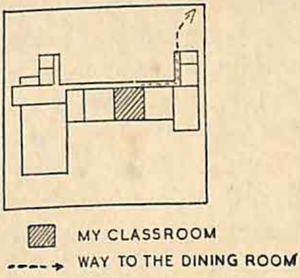


FIG. 9

In this series of "maps" the scale is progressively decreased from full size in Fig. 5, 1 in. to 10 in. in Fig. 6, 1 in. to 10 ft. in Fig. 8, 1 in. to 100 ft. in Fig. 9.

square and the sides are out of proportion. The next instruction therefore is: "We can make a better picture of this by placing the box on the paper and drawing round it—so" (Fig. 5). Now we have an accurate full-sized *map* which represents the object and it should be labelled with a title accordingly.

Next, on the same sized paper a picture of the desk lid is drawn with the object upon it (Fig. 6). As before there will be inaccuracies of size, proportion and shape, and these must be put right. The difference in this case lies in the fact that it is no longer possible to draw round the object because it is larger than the paper. Consequently the size of the object in the map has to be reduced. The map should be given a title to say what it represents.

Exercises on these lines can continue with the objects becoming larger each time. After the map of the desk lid it is logical to progress to a map of the classroom with the desk in it and also the other desks, tables, blackboard, cupboard and any other prominent features. These are shown roughly at first (Fig. 7) and corrected later (Fig. 8). To add point to the map each child can mark his own desk in a distinctive fashion. The map then becomes something a little more personal to him—"A map to show the position of my desk," or more enterprising still, the way from the desk to the door is marked in and the map then becomes—"A map to show how I get from my desk to the door."

The next step is a map of the school with the classroom shown on it (Fig. 6). There is an important development here which should not go unnoticed. So far the maps made have all been of objects which can be seen at one time without moving from the desk. Now the children are required to think beyond the immediate range of their vision. It is convenient for practical purposes as well as being a useful intellectual exercise, first to visualise what they imagine the shape will be and to make a rough map of it in the classroom, and then to go out and check it. It is not easy for children to "visualise" through classroom walls at first. A valuable aid is to take journeys from the classroom to the cloakrooms, to the dining room, to the head teacher's room thus providing something concrete for the mind to grasp. Small working syndicates are organised for this part of the work, each one responsible for measuring up a given section and for marking the shapes and relative positions of corridors and doorways on their own rough copies. The reports of these syndicates contribute towards a master-map drawn by the teacher on the blackboard. From this the children make an accurate version which corrects their own grosser mistakes. On this final version the classroom is marked to distinguish it from other classrooms and the journeys are shown by suitable lines and arrows. A title is given to the map to show its purpose.

A map of the school set in its immediate surroundings (Fig. 10) comes next and this marks the beginning of maps in the real sense of the word. The school is a focus which everybody knows and it is therefore a convenient starting place. In its immediate neighbourhood there are far more features than can be shown conveniently, so some must be selected and others ignored. As before it helps if some concrete fact is provided for the children to grasp, such as the route from home to school. The principal features associated with this route have then some element in common and these are the ones which can be shown. The first sketch is rough, to be corrected in class in very much the same way as the map of the school. But there is a difference in this case. Whereas the map of the school could be corrected by measurement and a reasonable degree of accuracy obtained in the final version, in the latter, meticulous accuracy is less important than seeing the school on its setting, with some conception of proper spatial relationships and of direction. The same point is even more apparent in the

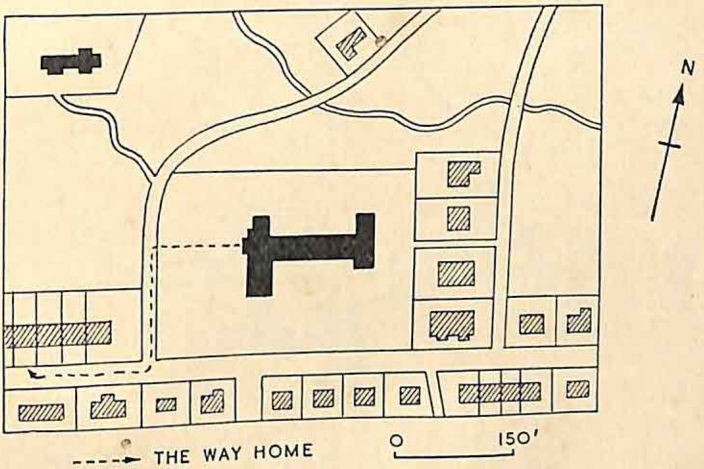
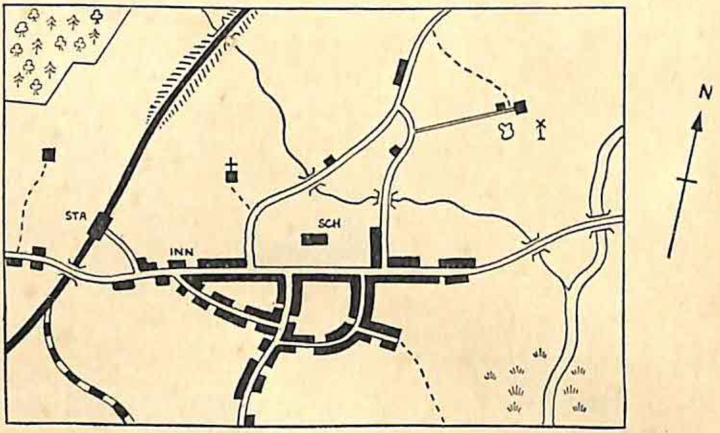


FIG. 10

next map of the neighbourhood (Fig. 11) which in the children's version has more of the character of a sketch map. At this point they should be introduced to the 6 inch sheet of their own neighbourhood and if possible a vertical aerial photograph to go alongside it. The two together help to point out so clearly that a map is after all only a special kind of ground-picture. On this scale the similarity is most marked, and at the same time a sufficient area of ground is covered by one sheet to give the children the illusion of a true " birds-eye view ". On both map and photograph they take great delight in identifying their own homes, their school and other local features. Imaginary " journeys " are made across the area in the form of exercises involving the measurement of distance and the identification and mapping of known features, and the insertion of others which the cartographer has omitted, but which are of first importance to the children. So the map becomes a personal document, well-known and therefore to be trusted. Sometimes the aerial photograph is more recent than the 6 inch sheet, containing features which have been added since the map was published. This is particularly noticeable in new urban areas where recent post-war developments have outstripped the local map. This does not mean that we lose faith in the map, but that we simply recognise it as a temporary record of a landscape that is liable to change. From constant use comes familiarity. Children soon become dissatisfied with their own rather crude



Scale: 1 in.=400 yds.

FIG. 11

first editions in the light of the 6 inch sheet. They produce new and amended versions.

THE FIRST PRINCIPLES

In making this series of maps, certain principles emerge which are common to all map making. These are:

1. *Title.* There is a special purpose for each one of these maps. Every one of them can be labelled: "A map to show . . . etc." This is a good habit to acquire from the beginning for one of the principal faults of many maps made later on in school life is that they endeavour to show too much and end up by showing nothing well. It should always be remembered that very soon children will be required to read what the maps have to tell them and this is not easy to do if they are overloaded with a heterogeneous collection of facts. It is far better to make a series of maps each with a limited but clearly defined purpose which is expressed in the *title*, than to make one which is over ambitious and which fails as a result.

2. *Key.* Another point which is soon discovered relates to the detail which the map shows and the method of showing it. In all of these early maps it is possible to draw the precise shape of the object. But as the area to be shown gets larger, so the amount of detail which can be shown gets less. This process continues up to Fig. 10 in which the shapes of the objects can still be preserved, but by Fig. 11, the size of the area has increased so much that shape can no longer be maintained and arbitrary figures or symbols are used in place of the objects to represent them. These may or may not resemble the objects themselves and a study of the development of symbolism in mapwork has a fascination all of its own. For the present it is sufficient to notice that symbolism is used, that it is convenient to adopt a conventional form of it, but that other devices may have to be employed from time to time to emphasise some particular point. For example, "my desk" in Fig. 5 is shaded to pick it out from other desks, and arrows and dotted lines are used elsewhere to indicate special functions. All these symbols and representations together constitute the language of the map through which it tells its story and this language must be properly understood before the map can be read. It is more likely to be understood when children have been accustomed to

using the language in making their own maps. They should also understand that other people may use the same map and to them the language may not be so clear: and also that they themselves may have occasion to use maps made by others which employ slightly different signs and shadings. Therefore the map language must always be explained in the form of a *key* which makes the message of the map clear to all who may need to use it. Children should be trained to supply a key with every map which uses any form of representation, and they should regard a map as incomplete without it.

3. *Scale.* The third principle to be grasped from this series of maps is that while the paper remains the same size, the area to be mapped progressively increases. In the first map the object is smaller than the paper and it can be drawn full size. In the second map the object is larger than the paper, therefore the map must be drawn smaller than full size, it must be *reduced.* In each of the maps which follow the reduction is even greater. How much greater does not matter very much at present. The essential thing at first is for the children to appreciate that the map represents on paper so much space upon the ground. Children are usually ready to make simple maps before they can begin to understand the complexities of scale, and they should not be held up because of it. But if they work their way through this sequence it should be less difficult for them to grasp that the same size of paper represents an increasingly greater area of ground-space. It helps to bridge the gap between this general idea and the idea of a scale which is mathematically correct if at first they measure objects which have some immediate interest for them, such as toy aeroplanes, toy cars, lorries, or railway engines. For instance, there are two scale models of the " Meteor " aircraft—there is a large one, professionally made on a scale of one inch to two feet, which is a handsome model twenty inches in length mounted upon a stand. There is also a smaller toy, two and a half inches long, on a scale of one inch to sixteen feet. If these are displayed together, it is perfectly clear that both have been *reduced* from full size, the one very much more than the other ; and the actual scale to which each has been made can be found out by measuring the models with a ruler and dividing the measurement into the length of the full-sized aircraft. Having discovered the scale, let them use it by making many other measurements on each model to determine the dimension of wing-

span, tail-plane, and so forth. Similarly toy cars and lorries can be measured to determine their scale (usually one inch to four or five feet) and the scales used to find their various dimensions. The principle of scale-measurement is now applied to the various maps which are first drawn approximately, and now, measured and drawn to scale. The desk-top, the room, and the school (or in very large schools, the wing of the school which contains the room) present no difficulty. Outside, a football pitch is a convenient area for practice mapping ; all its corners are square and all its lines are straight (with the exception of the centre circle) ; and on a scale of one inch to twenty yards it fits conveniently on to a quarto sheet.

This is one of the occasions when the teaching of mathematics and of geography support each other. As soon as the children have enough mathematical ability to do linear measurement, they can be taught that the exact proportion of map-distance to ground-distance is known as the *scale* of the map and they should have no difficulty with this by eleven years of age. When they have learned this, they should develop the habit of drawing a plain scale for each map they make, suitably divided and with the left hand division subdivided, into units for convenient measurement. It is a good practice if they take other measurements from their maps, stepping off units of distance *from their own scale* with the edge of a piece of scrap paper, or with a piece of string, or with a pair of compasses. This helps to teach them that plain scales are drawn for use and the more practice they have in using their own, the more clearly do they see the need for accuracy. Although this conception of scale normally emerges from the map sequence which has been described here, we do not need to press too strongly for a universal understanding at this stage. It often happens that children who are weak in measurement are quite capable of making simple maps, and there is no reason why they should be prevented from doing so. Their rough approximations help to give them a clearer understanding of space-relations, and of direction and there is little point in complicating matters for them unnecessarily by insisting on a meticulous accuracy which is beyond them.

* * * * *

When children have completed this sequence of events, they have learned the first principles of map making by actually applying them in practice. They are familiar with the idea of making a map for a special purpose and putting a title to it; they understand the need for representing information in the form of symbols and putting a key to explain them, and they have the first notions of scale. They have made a good beginning with their alphabet, and if it is learned by the time they are eleven, then they are well equipped to handle maps which have been made by other people.

But before they can be considered clear of the "spelling" stage, there is another element of map language which must be learned from the beginning, how to represent height. So far this has not appeared in any of the maps made by the children, except in an arbitrary fashion where they may have noted cliffs or an escarpment or a quarry on their rough maps as they explore their district. Rough shading is good enough at first while the maps are crude. Hill shading and hachures as done by professional cartographers give a strong impression of relief, but they suffer from the limitations common to all pictorial devices. They try to show the form of the ground and to preserve some element of the picture as well. They do not show the precise shape of the landforms nor the relative heights between high and low ground. They tend to obscure other detail, particularly if done badly and it is very difficult to do well. For these reasons free shading by children to show height must be replaced by some other method as soon as their maps begin to acquire some accuracy, some method which will show "form" rather than exact height. It is better to go straight away to form-lines, and these should be done at first by the teacher on cyclostyled or hectographed copies which serve as a skeleton for the neighbourhood map. The approach might well be: "Here is the map which you have made of your journeys. (As for example, at Fig. 2, in Chapter 2.) There are only two hills shown on it, the red cliffs, and the escarpment by the river. The shape of the ground would probably look something like this . . ." and at this point the teacher produces his cyclostyled copies which show ground pattern by means of form lines. . . . "Now let us see what we can pick out . . . the steep hill where the red cliffs are, the hill where the school stands, the cliff by the river, the flat river valley . . ." and so on. These features can easily be recognised because the children know them, so the function of form-lines in showing "form" or shape of ground is not difficult to follow.

On their own copies of this map, they can now put in the many other local features already done on their previous, rather crude, efforts. They finish up with an amended map of the neighbourhood which now shows relief as well. They have introduced themselves to the conventional method of showing relief by means of contours, but without the term having been mentioned. Working from well known local features like this is satisfactory up to a point, so long as the locality has sufficiently well-marked features to offer. If it has, then this home-made map with form-lines serves as a convenient link between the children's own maps and the more systematic map sheets of the ordnance survey. My suggestion is that these should not be introduced too soon, for they are intricate documents and they are apt to overwhelm. Therefore, except for the 6 inch sheet which children love to explore and which helps to clarify their own maps, I feel that their map work may pause at this point. They have a good grounding in first principles, and this is sufficient achievement for the end of their work in the primary school.

2. MAP READING

They stand now on the brink as it were, between " spelling " and " reading ". The boundary is an uncertain one, and perhaps in some ways it is not very profitable to make a distinction at all for spelling implies the initial stages of reading. While it is going on, the ability to read is being developed at the same time so it really amounts to this, that the process is a continuous one which becomes progressively more searching. If children have this history of map making behind them they are ready to pass on to the maps of the ordnance survey in the secondary school, i.e., to read maps which have already been made. This is not quite so simple as it sounds for unlike a book which presents its material in a reasonably orderly fashion, a map offers a wealth of information to the eye all at the same time, and it is not always easy to know how to select it. Systematic training in map work must include a training in how to select.

Perhaps it is most logical to deal with the structure of the landscape first as the background to the human drama that is enacted. Afterwards there follow the modifications to it which have come from the activities of men upon it as revealed in the conventional signs representing artificial features. This may be acceptable up to a point so long as the idea does not develop that there is "physical geography" which is taught at one time and "geography" which is taught at some other time. There is always a danger that this may occur when the human and physical aspects are separated from one another and ideally they should come together. If the separation, where it exists, is purely for the convenience of teaching and if it is realised that the character and individuality of a region derive from the combination of its physical and human patterns, then no very great harm is done. Therefore although it may be inconvenient sometimes to deal with both natural and artificial features at one and the same time, the close relationship that exists between them must be emphasised in map reading whenever they are temporarily estranged.

The choice of maps for study in the first year is made upon the principle that there is a logical continuation of the process which the pupil has pursued in his maps to date; i.e., he has started at home and worked outwards, gradually increasing the area covered with each successive step. He has shown his information first with pictorial devices, and later as the area increases, with arbitrary symbols which tend to become more and more conventional as his skill develops; his first efforts were crude, but soon develop into passably acceptable maps as his ideas of scale and accuracy increase. More important than all these, he has been brought up with the idea that his maps are very personal things—they have been made for the very special purpose of showing where *I* go, and what *I* have found. They are records which for him have some real meaning. If this idea is continued we need a map which includes home and its neighbourhood, but one which also stretches further afield than hitherto, which employs a specialised conventional language, is not too difficult to follow, and which can still be the basis for his own personal wandering. For he is now older and at twelve he will go further on foot and by bicycle, and he will see more. The most convenient for all these purposes is the local one inch sheet; it covers sufficient ground, its scale is easy to measure from; its language is simple and standardised and it has an established place as the standard "travelling" map for all who move about the country. Therefore I feel that it is probably better to make children thoroughly familiar with this one very useful map than to embark too soon on maps of a variety of scales. There are teachers who prefer to indicate variety of types and of scales when children first make their acquaintance with the ordnance survey. For this purpose we invite them to enter a helicopter and to hover just high enough for the ground to appear as in the six inch sheet. Detail is there ; it is quite possible to identify individual houses and streets. A little higher up over the same spot, the area of view has widened somewhat covering more ground, but detail though still present is rather less clear—this corresponds to the appearance of the two-and-a-half inch sheet. Higher still for the one inch sheet the view is much more extensive, but the detail begins to disappear ; villages become mere clusters, but certain prominent features are still there. Ascend further still always over the same spot, and we have a view which corresponds to the half inch sheet, when detail has gone, and roads and railways are mere threads. Although this does give a good impression of increasing area and decreasing detail, I feel that there is a tendency to confuse, and that on balance, it is safer to deal thoroughly with the one inch sheet until its language has been mastered.

On the local sheet all those features which have already been seen on the ground and roughly mapped are now rediscovered and compared with their own knowledge of the district which the map represents. In the case of local land forms for example it is a natural step from the teacher's map of form-line to the contours of the map sheet which shows the same features rather more accurately. After identifying as much of the relief as the children know, it helps to drive home the idea of " form " if they make a layer model of their neighbourhood in the way described in Chapter 8. For this purpose the contour pattern is simplified and the work split up among several persons. During the making of this model they complete their acquaintance with the lines. The term " contour " automatically appears and it is taken into use in conversation and in instructions about the work. The fact that when laid one upon the other they give the shape or form of the ground becomes clear as the model grows. Specific names for particular shapes or " landforms " are also learned at the same time so the function of contours in revealing form is apparent. It is also noticed that they bear numbers which have a significance of their own. By the time they have finished the model the children can congratulate themselves on having made it. The teacher can do the same for himself by having " taught contour " to his class with their assistance. An understanding of the purpose and significance of the lines has been achieved, and the use of such terms as " contour ", " closed contour ", " spot height ", " ridge ", escarpment ", " spur " and so forth, has become accepted in conversation not because they are so anxious to learn them, but because they are anxious to make the model and a knowledge of these things is necessary for its completion.

It is worth while dealing very thoroughly with contours for they are prominent features of the map sheets and they represent a new idea which has not previously been met. In using the local sheet for this purpose there is always an element of personal knowledge which is a great advantage, but as always with local work, it is largely a matter of chance as to whether the immediate neighbourhood has sufficient suitable examples to offer. Some localities are excellent for this kind of work ; some are equally barren. If the local sheet is devoid of good features, or if the contours are too complex to follow, it is better to chose another sheet which contains suitable well-marked landforms easy to identify, and these should be backed up in this case not with local knowledge, but with good oblique aerial photographs which show the character of the land shapes represented by the contours on the map. It is through work of this kind that children develop that " eye for country " which Miss Charlotte Simpson looks for.[1]

It helps very much in map reading if the grid reference system is known. There must be some way of directing the attention of everyone to the same place on the map at the same time, and the grid lines are the only satisfactory way of doing it. It is not so difficult to teach as is often believed. It is quite possible to use the numbering of the lines purely for locating purposes without bothering about where they come from or how they get their numbers, and this is well within the capacity of normally intelligent children of twelve years of age. The task is made a little easier if they are taught first to read the numbers at the head of the " vertical " lines, along the top of the sheet (e.g. 18), followed by the numbers at the end of the " horizontal " lines along the side of the sheet (e.g. 83). It is easy to get accustomed to this and to go no further for the time being, let them get into the habit of finding " line 20 " or " line 53 " as a guide to items on the map, and when they are used to this, and it comes very quickly, the two are combined as a four-figure reference, e.g. 18 83, and they have a rough idea of the area to look at. To visualise the division of the adjacent squares to the east and to the north of these lines into a further ten parts is not very difficult, and for simplicity the numbering which results from it can be regarded as two separate groups, and written (and spoken) as such, e.g. 181 833, (which is the map reference of HOPE railway station on sheet 111). It is easier to split the figures in this way. It reduces a reference figure to more manageable proportions. It is worth while spending some time establishing this simple skill for map reading is weakened until all the children and the teacher together can go quickly to the same place on the map.

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[1] C. A. Simpson, *Making Local Surveys*.

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The examples of map reading which follow are based upon the one inch Ordnance Survey Sheet No. 112 (Seventh Series). They are essentially " teaching " examples, with the teacher instructing his class in the various features as they are met. They are not in any sense a test of work previously done, although of course, tests *can* be arranged in this form if desired.

AN EXAMPLE OF MAP READING FROM SHEET 112

Examples of this kind are best done out on the ground with map in hand, but they can be taken almost as well in the classroom as " imaginary journeys " to add a little stimulus to the reading of the sheet and to get the feel of the landscape which the sheet represents. In this case the instruction is :

" Starting at ring contour 300 feet at point 595398 we can see the country covered by the map quite clearly—the race-course with its straight mile ; the flat plain of the Trent ; the low hills on the other side of the valley.

How high are these hills, approximately?

How far away are they from where we stand?

Pick out the names of some of them ; write them down.

Notice also the river meanders and the boats on Holme Cut ; and the little villages with their church spires.

Pick out the names of those which you can see. Write them down.

Now let us take a walk across this country and see what we can find.

First, scramble down the escarpment in front of where we stand.

Cross the railway lines by the road bridge at 601397.

Cross the racecourse and over the river by the weir where there are stepping stones, at 608392. Walk to 613387. What is the figure given here? Then how high above the river is the hill on which we have just been standing? Follow the road going south. Cross the Grantham Canal by the bridge over it at 616371. Walk east along the canal bank. How far is it to the first lock? How many more locks are there on this canal? What is their purpose? In which direction is the 'rising ground' on this canal? Follow the canal to the road bridge at 639367. Leave the canal here and take the road south through Cotgrave, passing its church with its spire at 644354. (We could see this from the top of the hill at 595398.) Go on for another mile. Are we going up hill or down? Where is the steepest part of the hill? Can you see any road on this map with a steeper hill? Where is it? How is it marked?

We are now at the top of the hill and we can rest at the ring contour at 650339. What is its height?

Look back across the valley. We can see the steep escarpment where we scrambled down at 595398. We can see the flat valley floor with the river meandering across it, and the ground rising to the hill on which we now stand. Look to the north-east and see two regular shaped little hills at Hoe Hill 680363 and at Berry Hill 673368, with ring contours. What name have we for hills of this shape? Draw their shape. There are two more in front, Dewberry Hill at 657388 and another, unnamed at 645383. On both sides of us and behind us there is *undulating* ground, not very steep, with contours roughly the same distance apart. Is the hill on which we now stand higher or lower than the one we started from? How far away is it? Draw the shape across the valley, from the point at the beginning, to the point at the end of our journey."

Similar journeys can be arranged to cover all the usual features shown by map language, down the Fosse Way for instance, or along either of the railways covering their bridges, cuttings, tunnels and embankments. The method can be varied according to the ingenuity of the teacher. A *treasure hunt* will always add a little spice to the proceedings viz :

" I have buried a treasure at a secret place ; you have got to find it. I started from the railway station at Radcliffe at 648396, and walked out of Radcliffe on the road running to the south-east, to the point where it joins the Fosse Way at 675375, and there turned to the right down the Fosse Way for two miles exactly. Here I took a compass reading,[1] and walked on a bearing of 210 degrees for a mile and a half, when suddenly I remembered that I must urgently send a telegram, so I went to the nearest village where this could be done. After this I stood by the church at midday, so I struck across country going south by the sun. A little over a mile brought me to a wood, and on the far side of this wood, a little stream which just suited my purpose. I turned downstream and followed its course until the first little tributary joined it. There at the confluence in a hole in the bank, I buried my treasure.

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[1] Assume for this purpose, a magnetic variation of 10° W. and that grid line 466 runs N.–S.

Where is it?" (638332).

Variations on this type of work can be made to teach the reading of map language in all its forms—the conventional signs, scale, bearing, landforms, they can all be included and *in their natural setting in the landscape*. It is so much more realistic than to be presented with a list of names to write or symbols to draw, or to copy out stereotyped diagrams of landforms, or to make-up imaginary and improbable maps. I can see no point at all in the type of exercise which begins: "In a rectangle six inches by four inches draw an imaginary island with contours . . . etc.," when the countryside is an open book and a wide choice of ordnance survey sheets lies ready to our hand offering all the variety we need.[1]

In the early stages of map reading children are concerned more with picking out particular features so that they may learn them closely. At first they notice simply that in some places the contours are close together and in others they are far apart. They recognise the familiar patterns and learn their names. They pick out the simpler valley forms and the types of rivers which go with them, for example the thin blue line hurries down the steep sided valley but in the flood-plain below the line is much thicker and it meanders slowly along with no sense of urgency.

Later in the secondary school as the children become more practised the nature of their map reading changes. It becomes not merely a matter of recognising features, but rather they now look for their position in, and appreciate their contribution to, the landscape of which they form a part. In addition there is the recognition of map features of a more complex nature, so a variety of regions must be studied which offer a contrast to or a comparison with, the local region. They now look beyond the simple features.

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[1] Sections of one inch sheets used by the public examining bodies are available from the Ordnance Survey at very modest rates so long as supplies last. They are of convenient size to fit on a desk and quite large enough to be characteristic of the regions they represent.

G.T.G.

Whereas formerly they saw just a hill slope, now they appreciate the fact that there are various kinds of slopes—concave, convex, uniform; formerly they would merely distinguish hill and valley, now they are aware of hill features of various sorts, and various forms of valleys—the young, the mature, the V-shaped, the U-shaped, the dry, and the hanging valleys, each with its own significance and with its own characteristic shape in profile. In the earlier stage they would pick out rivers; now they seek for varieties and find them in intermittent drainage, in river-capture, braided drainage, and other specialised forms. Using a variety of sheets and becoming familiar with different landscape patterns, they fit these more complex forms into their appropriate setting, and the reasons for them and the associations that go with them are thus made clear. It is here that the combination of map and photograph is so useful. Some features, such as the truncated spur or the hanging valley may not be revealed by the contour interval on the map, but they stand out quite clearly in the photograph.

3. Map Interpretation

As his skill and accomplishment in map reading develops, the senior pupil passes from the stage of reading his facts to the next stage, which is to *interpret* the significance of what he sees. When he does this, he has reached the *third stage* of the geographer's method of working. His geographical work is now an intellectual exercise devoted to seeking reasons, forming associations, and drawing conclusions.

He has long been accustomed to identifying physical features from contour areas. Let us assume that he identifies from a map, dry valleys. It is a matter of no great difficulty for him now to associate these with the chalk or limestone country or to infer that where these formations predominate, dry valleys may be expected. Or again it is not difficult to visualise the work of glaciation resulting in the hanging valley and the truncated spur, and pupils who make such associations are acquiring the habit of marshalling their facts and drawing conclusions from them. They are then equipped by training to apply this process of relational thinking to other problems of interpretation. In these examples they should be able to reason the other way round and to say that since dry valleys are observed it is suspected that the region may be chalk or limestone. They then look for other features in the region and notice these: a general absence of surface drainage; intermittent streams shown by little networks of blue lines which run in curious directions; sudden variations in the thickness of a watercourse which suggest sudden inflow from a subterranean source; they notice also the frequent occurrence of the word "quarry", or such odd names as "Waterswallows" or "Gaping Hole". The contours convey an impression of an area of deep dissection and abrupt features. From all this evidence the conclusion is reached that the region is one of carboniferous limestone. Or in the second example, a scrutiny of the map and photograph together reveal the presence of truncated spurs. It is reasonable to suspect the possibility of glaciation, and if the other features such as the hanging valley and the main U-section are also present, then it is justifiable to conclude that the region has in fact been glaciated.

The example which follows is based upon the one inch Ordnance Survey sheet number 111.

AN EXAMPLE OF MAP INTERPRETATION FROM SHEET 111

In this section of sheet 111 a revealing exercise is obtained by contrasting two upland areas as follows:

1. The area bounded by the lines 10 to 16 and 75 to 83.
2. The area bounded by the lines 20 to 27 and 83 to 90.

In 1, these features are noticed:

(i) An absence of surface drainage.
(ii) Intermittent drainage at 113823 and at other places in the same neighbourhood; again at 115787, 127754, and 115768, and all the way down the well marked dale from Dam Dale 117780, Hay Dale, to Peterdale 127757.
(iii) Dry valleys at 123804, 116823, 148825, and many other places.
(iv) The sudden thickness of the blue line near the source of the Peakshole Water.
(v) A generally dissected surface.
(vi) The frequent occurence of the words "old lead mine".

From this evidence it is possible to build up a picture which is characteristic of carboniferous limestone country, a dissected country of no great height and without marked prominences or excessively steep slopes, but with certain sudden and abrupt features in the steep-sided dales. Open country, but sufficiently supplied with settlements and roadways to suggest that it is given over to agricultural uses.

By contrast in area 2 there is noticed:

(i) A general abundance of surface streams.
(ii) Abrupt "edge" features with relatively flat summits at 205850 (Bamford Edge); 195890 (Derwent Edge); 238848 (Stanage Edge), and extending for considerable distances from these points.
(iii) Evidence of marsh and rough pasture on the moors above the edges.
(iv) Frequent occurrence of named "rocks" and "stones", as at 196894 (The Salt Cellar); 253832 (The Cowper Stone); 265825 (The Burbage Rocks); 208848 (Great Tor); 203878 (The Hurkling Stones); 203885 (The Wheel Stones).
(v) Occurrence of the words "Shooting Cabins" at 225855 and at 215882.

All these features help the student to visualise a region which is in marked contrast to region 1. Steep cliff edges indicated by the packed contours[1] and the cliff markings rise abruptly to the high moors which slope gently away eastwards from the cliff top with remarkably even surface. These moors abound in springs, streams, and moss. A great many isolated rock masses are distinctive features of this landscape and like similar features everywhere many of them have been honoured with curious local names. All this is characteristic of the millstone grit scenery—steep edges, high, bleak, wet grouse moors adorned with numerous crags which have been weathered into unusual and fantastic shapes.[2] The region is of little use for agriculture.

Both these descriptive pictures can be pieced together from what the map has to tell, and in schools this is geographical interpretation of a fairly high order. Useful intellectual exercise though this is, impressions of this kind should always be confirmed by comparing the topographical and geological maps together, and wherever possible, with suitable photographs. These can provide further detail which is not revealed by the map, for instance the dry-stone walls which are so prominent a feature of the limestone country show up clearly in the photograph but they are not revealed by the map.

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[1] The contours join at 235848.

[2] There are many more in this area, some bearing such picturesque names as The Toad's Mouth (Hathersage Moor) the Boxing Glove (Ashop Edge), and the Rocking Stone not far from Hathersage Moor. Differential weathering of the grits of various hardnesses have produced these extraordinary shapes which are reflected in the names given to these crags.

* * * * *

Geographical interpretation is not confined to topographical features. The human and economic aspects of a region should also be read in relation to the structure. At this stage in the work pupils should be trained to extract as much information as they can from the map by direct reading, by inference, and by comparison with other sources. A comparison of sheet 111 with the geological and land utilisation sheets of the same area would reveal the relationship that exists between surface features, underlying structure, and the economic usefulness of the various parts of this area. Such relationships are of the very essence of geographical study and it is to this end that children should be trained. Sir Halford Mackinder expressed this most clearly when he said: "There are few joys greater than the intellectual joy of suddenly seeing the co-relation of things which were formerly detached."[1]

A study of the settlements themselves has much to tell. Often the reason for their positions cannot be discovered by scrutiny of the map, but sometimes they are sufficiently obvious or can at least be inferred. There are those which stand at a natural meeting place, at a crossing of a river or in a strategic position. In some districts, notably in the limestone and chalk districts it can be seen how the settlements and indeed individual farms seek out the spring line in this water-seeking country, or tuck themselves into the fold of a dry valley for shelter. In the low lying flood plains the little villages cluster on the tops of modest undulations, on a patch of glacial gravel perhaps, as a refuge from the winter floods. In the upland areas of sheet 111 settlements lie for the most part in the principal valleys, avoiding the hills. The more isolated discover a sheltering clough or dale. There are none on the open hills. In the lowland area of sheet 112 by contrast, the settlements are openly dispersed over an agricultural region of much greater economic value. The shapes of the villages reflect their situations.

[1] Sir Halford Mackinder: "The Development of Geographical Teaching Through Nature Study," *Geographical Teacher*, Vol. 2.

In the high valleys they tend to string themselves marginally along a single road as at Edale 123860 on sheet 111. In the plains the villages are compact and tightly grouped, as at Cotgrave 105553 or Cropwell Bishop 145553, on sheet 112.

Their names invariably provide an insight into their social or economic or historical background. Trades, migrations, invasions of long ago are revealed in the names which still appear on the map today. The —*ton* or —*ham* so common and so widespread indicate the extent of Anglo-Saxon settlement. The Danish —*thorpe* and —*by* occur more frequently near to the rivers which were the highways for these invaders. Other influences from across the sea are indicated in the Roman *caster* or *chester*, and names of obviously French character but of mixed origin occur in Ashby-de-la-Zouche and Chapel-en-le-Frith. The Old English —*ley*, the water meadow, has a more restricted range, and so has —*bourne*, the intermittent stream of the chalk country, as in Ogbourne St. George and Ogbourne St. Andrew which lie to the north of Marlborough.

Communications between the settlements fit the nature of the district. The difference between the principal artery which crosses the region bound for distant destinations and the intricate network of minor roads which serves an agricultural community linking up each farm and village is seen in sheet 112. The control exercised by relief on principal and subsidiary roads alike is shown in sheet 111 where the main roads follow the main valley lines, while the minor unfenced roads creep up the dales and cloughs to serve an isolated settlement, and to end there. It is also instructive to notice the means of overcoming natural obstacles by means of fords, bridges, viaducts, tunnels, or by skilful siting. Different means are employed according to the needs of different districts. It is no accident that tunnels and cuttings occur so frequently on sheet 111, nor that level crossings and hump-backed bridges are found in astonishing numbers in the flat level country of the Fens. There are reasons for these things, and the reasons are to be found by closely scrutinising the map.

Some areas show a wealth of historical evidence which points to the character of the region long ago. Roman roads run direct with a fine disregard of local features, their purpose being found far away, not locally. The Fosse Way on sheet 112 is one of them. Drove-ways for the movement of cattle and sheep; salt-ways, pilgrims' ways, pack-horse ways, ridge-ways along the Downs; each one of these throws interesting light upon the movements of people long ago. Local names of cross roads or of inns often reveal where formerly there stood a toll-house, a gallows, a coaching stage, or the town gates. The siting of castles or of tumuli were often determined by geographical considerations. The monks of long ago showed a shrewd geographical sense when they placed their monasteries on fertile ground, within the protection of sheltering hills, with local building stone to hand, and good fishing. Tintern, Ulverscroft, and Whalley are but a few of these.

As always some regions are more prolific in such historical associations, while others are less rewarding, but an intimate study of the ordnance survey sheet often reveals much that might otherwise be missed.

* * * * *

CONCLUSION

The sequence of events described in this chapter is based upon the belief that map reading in the schools should mean very much more than an acquaintance with the conventional signs together with some knowledge of direction and scale. Children should be brought up to regard a map as a document which describes a living landscape and once they have found the secret of its language they should learn to see through the map to the land which it represents. They should begin to do this by making maps for themselves; pass on to the Ordnance Survey sheets when they are ready for them; read first the simpler facts which these sheets have to offer, and their subtler aspects later; and finally enjoy the intellectual satisfaction of interpreting them in the true geographical manner. Here is the complete process which goes through all the three stages of geographical method—of observing, recording, and of reasoning about the observations.

Not everyone will run the full course. Very many will not, but that is no reason why they should not be taken as far along it as their individual capacities allow.

The process is a progressive one, but it need not necessarily be continuous nor need its various stages be strictly consecutive. It is often educationally sound to take a concentrated spell and complete a stage, and then to leave the work and pass over to some other aspect of geographical study which gives variety and allows time for that stage to mature. Subsequently the next stage is taken up with renewed zest by reason of the change of occupation and the additional maturity of the pupils who are all the more ready to undertake it. This stage in its turn is completed and left, with another pause before the next, and so on.

It is never easy to say when these stages shall fall or to which age groups they should correspond, because children vary so much in their attainments and in their intellectual capacity and interests. There is variety too in the nature of the assistance and the incentive which they get from their teachers, and in the opportunities which their schools offer. As a generalisation I have suggested that the preliminary " spelling " stage might occupy the primary school up to the age of 11 years. The work is then left for a while, and resumed with the elementary forms of map reading with the Ordnance Survey sheets in the first year of the secondary school. The more advanced map reading might come in the middle form of the grammar school, while map interpretation is reserved for those senior pupils in the upper forms who undertake geography as a serious study. From what I have seen I form the impression that these stages, with the intervening " pauses " which accompany them, would suit the majority of the pupils at the various levels which I have just mentioned for the reason that the work involved in each case appears most appropriate for them. I am aware that modifications can be made according to the conditions which obtain in different schools. Very many will be able to achieve a more ambitious programme, and undertake certain sections of the work much earlier. There are always enthusiastic and exceptionally capable teachers who can successfully introduce the Ordnance Survey sheets into the primary schools, particularly the 6 inch sheet which shows detail on such a scale that children delight in finding their own homes and schools. These sheets are therefore well suited to follow hard upon the childrens' own maps. But in the case of the 1 inch sheet which is a much more intricate document, I incline to the view that there is little to be gained from introducing it too early, and that most children take to it all the more readily after a very thorough grounding in the " spelling ", and when they are somewhat older.

Finally I would emphasise again that once map reading has been seriously undertaken it should be based upon the map sheets themselves.

BIBLIOGRAPHY

Olive Garnett, *Fundamentals in School Geography*, Harrap, 1949.

Alice Garnett, *Geographical Interpretation of Topographical Maps*, Harrap. 1935.

E. H. Reeves, *Maps and Map Making*, 1910.

A. R. Hinks, *Maps and Survey*, Cambridge, 1933.

E. Lynam, *The Map Maker's Art*, Batchworth, 1953.

M. Newbigin, *Ordnance Survey Maps : Their Meaning and Use*, Johnstone.

Ordnance Survey, *Description of Large, Medium and Small Scale O. S. Maps*, Ordnance Survey, 1947.

R. V. Tooley, *Maps and Map Makers*, Batsford, 1949.

E. Lynam, *British Maps and Map Makers*, Collins, 1934.

ARTICLES IN *Geography*

E. M. McGarry, The Correlation of Simple Map Work and Field Work, Vol. 19, 1934.

P. H. Guenhault and F. L. Ralphs, A Realistic Approach to the Study of Maps, Vol. 19, 1934.

E. J. Orford, Ordnance Survey Maps : An Experiment, Vol. 20, 1935.

E. David, Childrens' Maps : An Experiment, Vol. 25, 1940.

Geographical Association, Children's Interpretation of Contours, Vol. 26, 1941.

D. Sylvester, A Method of Panorama Construction from Contour Maps, Vol. 28, 1943.

E. David, Teaching Contours, Vol. 29, 1944.

A. Illingworth, An Approach to Map Reading, Vol. 31, 1946.

T. C. Warrington, Ordnance Survey Maps, Vol. 32, 1947.

CHAPTER 4

MAPS OF THE WORLD

> Aristagoras of Miletus needed another ally and he approached Cleomones the Spartan. Now when Aristagoras came to the Spartan court he came armed not only with spears and swords but also with a bronze tablet on which the map of the earth was engraved, and all the sea and all the rivers, and this Aristagoras used to back up his arguments.
>
> "Here are the Ionians" he said as he laid the proposition and the tablet before Cleomones, "and here are the Lydians, and next to them . . . are the Cilicians whose land reaches the sea yonder, wherein you see the island of Cyprus lying."
>
> I. J. CURNOW

An intimate knowledge of the map of the world is useful for many purposes other than military strategy, and Aristagoras is not alone in pointing to its value in illustrating or in emphasising an argument.

As soon as children begin to acquire information about other countries they need to record it on maps. The "geographic vocabulary" which I mentioned on page 33 of Chapter 2 certainly includes a knowledge of the other countries of the world, their shapes, their positions in relation to one another, their names and the names of some of the principal features contained in them, the names of the seas and oceans which surround them. There is little virtue in learning these things in lists which have no meaning for a child; but there is less still in not knowing them at all. These things *ought* to be known, for they help to widen the horizon beyond the immediate neighbourhood, unfolding the rest of the world.

THE WORLD OUTLINE

Prominent among these fundamental facts is a thorough familiarity with the outline of the world map. This is basic working knowledge which a child ought to have by the time he is 11 years of age, and it needs to be taught carefully and precisely. One way of doing it lies in tracing out the history of geographical discovery.

GEOGRAPHICAL DISCOVERY

A suitable selection of explorers is chosen, whose exploits will build up the world outline from scratch. My selection for this purpose is—Marco Polo, Bartholomew Diaz, Vasco da Gama, Columbus, The Cabots, Drake, Magellan, and Captain Cook. Their stories provide vivid description and stirring narrative. The maps which the children have to make to illustrate these stories together compile the world-map piece by piece. These maps should be made from originals of the same scale, and on pieces of paper of the same size. Children then see the map grow as the sequence progresses from a blank sheet at the beginning to the finished outline at the end. If we take some liberties with chronological order and begin with Bartholomew Diaz, the map illustrating his voyage will appear as in Fig. 12. It has the merit of being very simple having very little on it, and this is important for children who are just beginning with maps. It has a few names, a route-line, the land shaded to distinguish it from the sea, and latitude and longitude O degrees. The eastern coastlines are purposely left indefinite because they are not known. The next map in the series showing the voyages of Marco Polo, will repeat the first and add much of the missing outline from the eastern hemisphere and more names (Fig. 13). The stories will reveal the

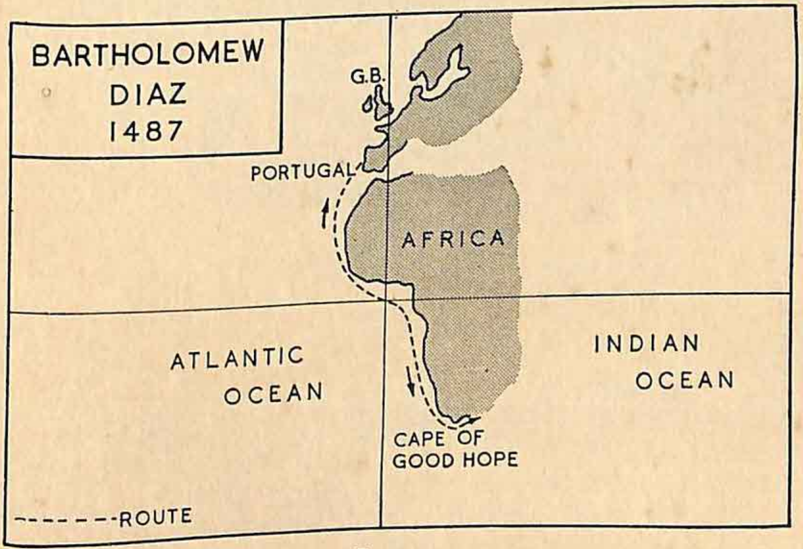

FIG. 12

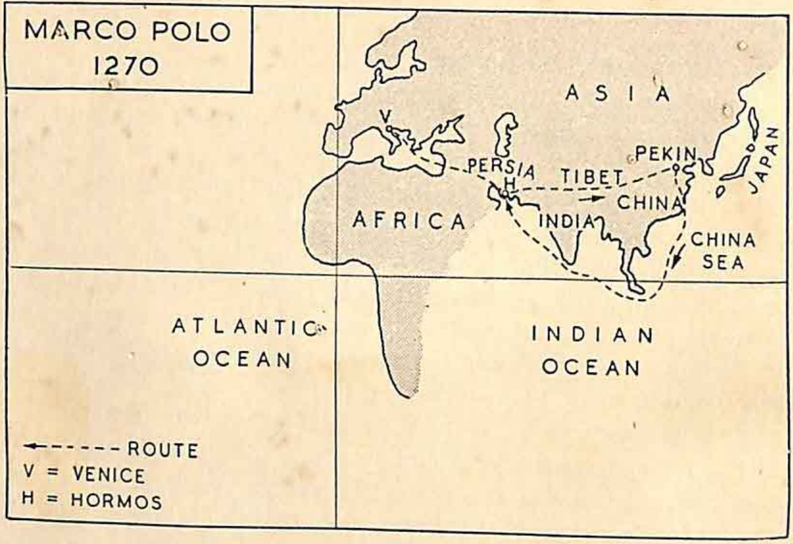
MARCO POLO
1270
ASIA
V
PERSIA
H
TIBET
PEKIN
JAPAN
CHINA
INDIA
AFRICA
CHINA SEA
ATLANTIC OCEAN
INDIAN OCEAN
←----- ROUTE
V = VENICE
H = HORMOS

FIG. 13

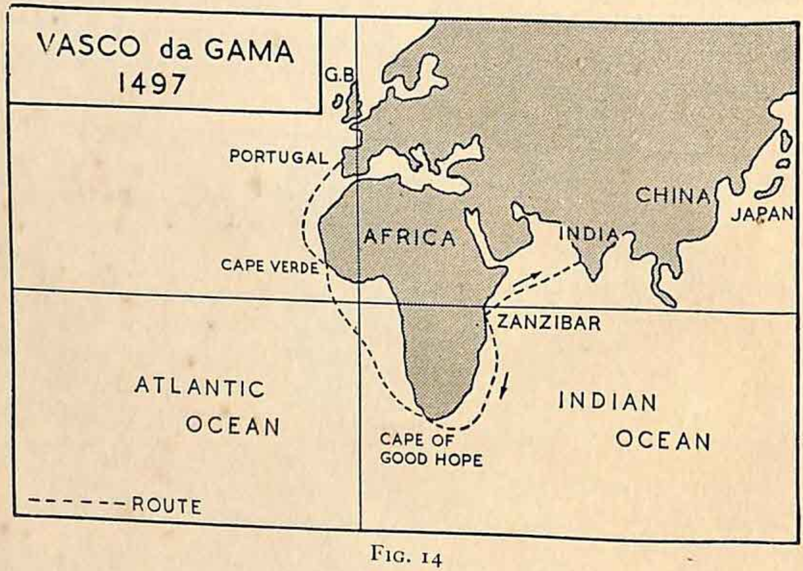
VASCO da GAMA
1497
G.B
PORTUGAL
CHINA
JAPAN
AFRICA
INDIA
CAPE VERDE
ZANZIBAR
ATLANTIC OCEAN
INDIAN OCEAN
CAPE OF GOOD HOPE
------ ROUTE

FIG. 14

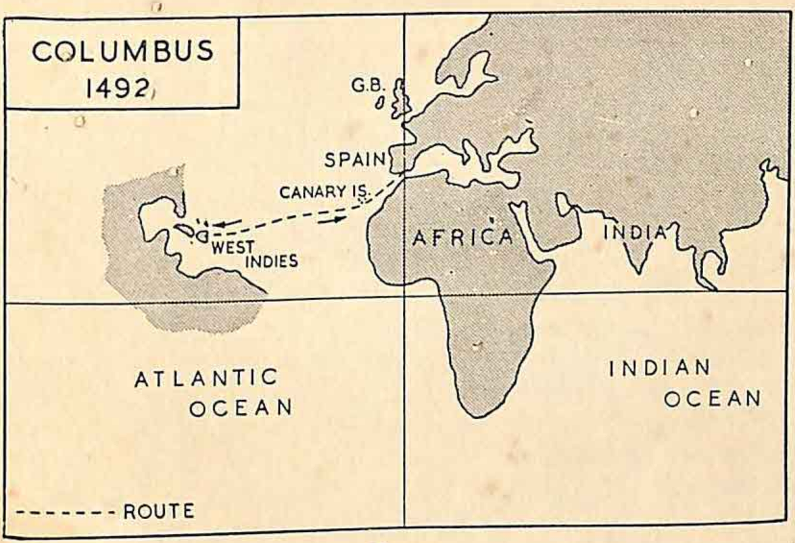
COLUMBUS
1492
G.B.
SPAIN
CANARY IS.
WEST INDIES
AFRICA
INDIA
ATLANTIC OCEAN
INDIAN OCEAN
------- ROUTE

FIG. 15

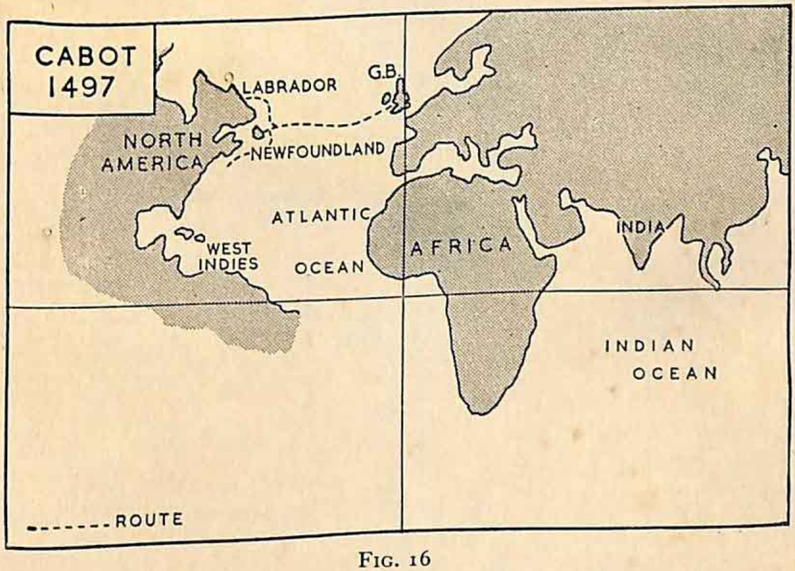
CABOT
1497
LABRADOR
G.B.
NORTH AMERICA
NEWFOUNDLAND
ATLANTIC OCEAN
WEST INDIES
AFRICA
INDIA
INDIAN OCEAN
------- ROUTE

FIG. 16

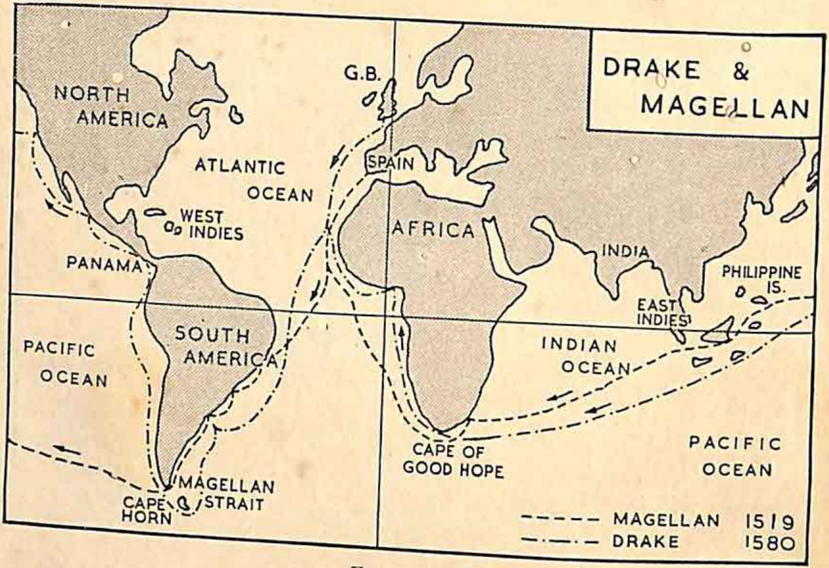

FIG. 17

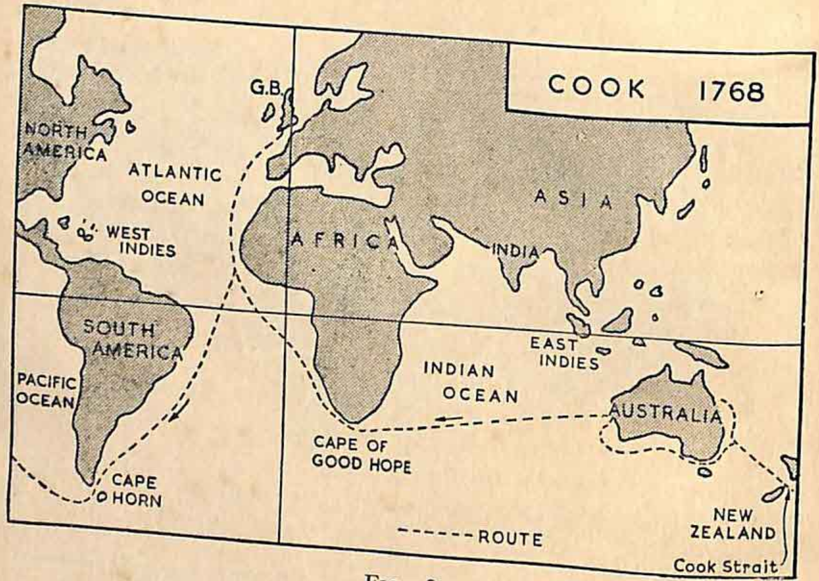

FIG. 18

This series of maps should be drawn on paper of the same size, and to the same scale.

eastern world imperfectly known and the search for a sea-route from Europe, partially discovered by Bartholomew Diaz and completed by Vasco da Gama ten years later (Fig. 14). On this map the missing outline appears and the eastern hemisphere is complete. In Fig. 15 the children's attention is taken across to the New World with Columbus in 1492, and the appropriate parts of the new coastline are added in what has hitherto been a blank space. The Cabots allow us to fill in the eastern coastline of North America (Fig. 16) and the west coast of the new continent emerge from the stories of Drake and Magellan (Fig. 17). Finally Captain Cook adds Australia and New Zealand to complete the world map (Fig. 18). From the children's point of view no doubt the greatest interest has been in the exciting events of the voyages and the robust personalities of the explorers. But they need to make the maps to support their stories. It is not unusual in teaching for a mechanical and rather uninspiring task of this kind to " borrow " as it were a vicarious interest from another source if the task itself is somewhat lacking in incentive.

Many new names are taken into use by actually employing them in their proper context—names of places, towns, rivers, oceans; names of geographical significance such as equator, hemisphere, globe, circumnavigate, the principal compass points and many more. All these things are learned by the sound psychological principle of starting with very little and adding to it a little more on each successive occasion. Thus in the first map there is very little coastline and few names. On the next map these are repeated and more outline and more names are added to them. The third map repeats the second and adds more still. So does the fourth, and the process continues, repeating what is known and each time grafting on a little more until the last map is made. Children trained in this sequence know their world at the end of it. They also make acquaintance with the globe by picking out the routes upon it and then translating them on to the flat map. If each map in the sequence is kept in a constant position on the children's paper, i.e. with longitude O degrees down the centre with the outlines of the two hemispheres developing on both sides of it, there is then little difficulty in appreciating that we have in fact split the globe and rolled it out flat. It is for this reason that I suggest longitude O should appear on the very first map. It has no immediate relevance there, but it does help on every map thereafter to locate the components of the developing outlines in the same position each time. Children become familiar with this location and with the relative positions of the land masses to one another. They are then less likely to be confused when the relationship between map and globe emerges from the round-world voyages.

PRINCIPLES OF MAP MAKING

The same principles of map making apply to these world maps as to the large scale maps discussed in chapter 3.

The first principle is that children learn their maps by making them and not merely by looking at maps which have been made by other people. Constant use breeds familiarity, and if as in this case, the object is to learn certain basic facts, such as shapes and names, then learning is best done by actually drawing the shapes and writing the names, on maps of their own making. There is less likelihood that children who have done this will confuse coastlines with rivers or political boundaries, or join landmasses across straits (which is frequently done in Gibraltar), or cut through an isthmus to isolate two landmasses where they should in fact be joined. Errors of this kind which give rise to some exceedingly original land-shapes are quite common, and they invariably arise from insufficient practice in *making* maps, and imperfect correction in teaching.

Secondly, there should be the same emphasis on the fact that each map is drawn for a specific purpose, which appears in the title; and that only information which is relevant to this purpose should be shown upon it.

Thirdly, maps should always be drawn on the assumption that they are to be *read* after they have been made. Therefore the simpler and more direct they are, the better do they serve their purpose. A map should never be so overloaded with detail that it becomes a confused jumble. It would be better to make a series of maps, each with its own limited scope, and to standardise as far as possible the language which is used upon them. The meaning of the map language should be made clear in the key, and pupils should be trained to regard the key as an integral part of the map, and essential to the interpretation of it.

Finally, children should be taught from the beginning that neat execution always makes for legibility and good map use. No useful purpose is ever served by accepting slovenly standards in map making.

* * * * *

Making the Outline

Freehand outlines drawn by children are rarely satisfactory. They are not easy to do and they waste a lot of time. Gross errors are liable to occur, and when these errors include faults in the shape of the coastline and marked exaggerations of area and distance, then the result bears little resemblance to the country which it is intended to represent. The lack of proper proportion between one part of the map and another, or between the relative positions of countries in respect to one another, make freehand maps of little use. Errors of this kind tend to persist and set undesirable precedents. Children should not be expected to use maps which do not teach them the correct form of the country which they are studying, or which do not give them a chance to put their information on to their map with a reasonable degree of accuracy.

There are two alternatives to freehand drawing. Either prepared outlines can be given to children, and on these they put their data. Or, expedients of various kinds can be adopted which help the children to make sufficiently accurate outlines of their own.

Prepared outlines have the virtue that they are correct, and that they save time. Such outlines should be completely blank, that is, showing the coastline only, all other matter being put on to the map by the children themselves. The danger of the practice of using prepared outlines, is the tendency to put too much on to them, thus doing for the children, work which they ought to do for themselves. Children are also apt to accept them uncritically without really *learning* their shapes, and without differentiating between land and sea.

When children are making their own outlines, it helps them if they have some assistance in maintaining proper shape and proportion.

Guide lines will help them to achieve a reasonable degree of accuracy. If the lines chosen are meridians and parallels, either single lines or in the form of a simple graticule, they not only assist the drawing, but they also begin to associate in the child's mind particular countries and particular coast-forms with certain lines of latitude and longitude. There are examples in Fig. 19; thus in South America, the equator is seen to cross the coast at the mouth of the Amazon, and the span of the continent from north to south is measured very roughly by latitude 10 degrees north and 50 degrees south. It is not difficult for a child to measure off units of 10 degrees which give a rough guide to size. Longitudes 80

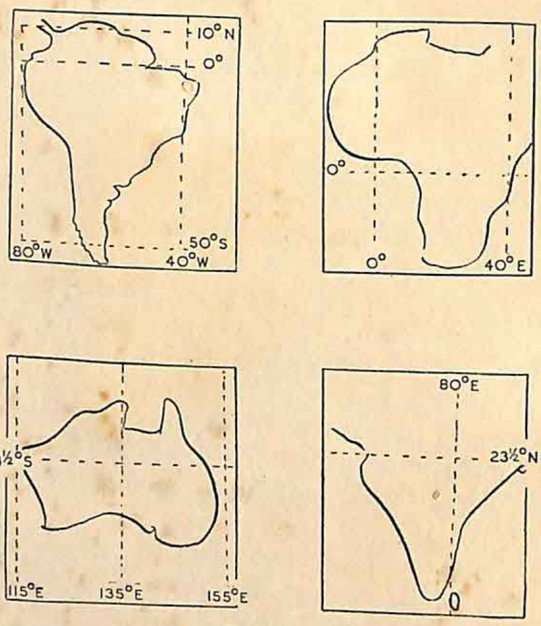

Fig. 19

degrees west and 40 degrees west set the approximate limits for the west and east coasts. Africa is roughly bisected by the equator, which runs just to the south of the "bight" formed by the Guinea coast. The meridian of Greenwich crosses the equator roughly half way along this coast; longitude 40 degrees east gives a line for the east coast. Australia is singularly unsymmetrical, but it is nothing like so difficult to form as it appears. The Tropic of Capricorn gives the position of the critical angle at North-West Cape, and the sweep of the north and south coasts lie roughly the same distance away from it. The extent of the country in an east-west direction, can be judged from the position of meridian 135 degrees east which lies conveniently down the centre, with east and west coasts roughly 20 degrees away from it (115 degrees and

155 degrees east). In India the Tropic of Cancer and longitude 80 degrees east help to maintain the proper proportion in this very easy figure. These, and similar combinations can be learned and memorised by frequent use; maps are improved, children acquire early a familiarity with lines of latitude and longitude which stand them in good stead later on.

THE FRAMEWORK

Children also find it helpful to have guidance on the *size* of the map and the proportion of the map to the page. The teacher who knows beforehand how much detail there is to go on the map, can visualise the finished product and he can help by setting precise limits within which it is to be drawn. This avoids those large sprawling maps which cover a page showing a vast area of empty space with very little on it. Maps of this kind are aesthetically displeasing and a waste of space. A framework sets a limit to size and provides a neat finish. It also helps to lead the eye to the map outline, especially if the coastline does not make an enclosed figure. The shape of a map is provided by its coastline, political frontiers or other boundaries. Even when children are acquainted with the shapes, it is not always easy for them to tell which is the land and which is the sea. In this, as in any other aspect of visual perception it is a matter of being able to distinguish the " figure "

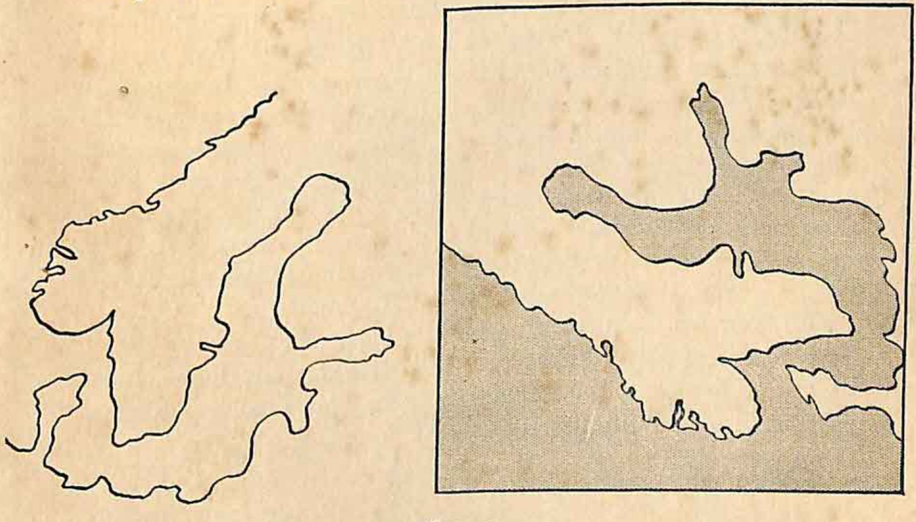

FIG. 20

from the "ground"—the figure being the land, and the ground being the background upon which it appears, i.e. the sea which wholly or partly surrounds it. It follows that the general pattern should attract the eye first to the land surface, so recognising it as the "figure"; and figures are more easily discerned when they are made to stand out of their background by being more luminous, or completely enclosed,[1] or when they are very familiar. The land area should be totally enclosed to make a complete figure, the coastline if incomplete being continued up to a surrounding frame. This is illustrated in Fig. 20.

TRACING

The actual process of tracing out a figure, the movements of the fingers and the concentration of eye and mind help to teach the shape by repetition. Tracing is simply another form of guide, and like any skill it needs to be taught. If left to themselves children will follow any line which appears sufficiently boldly through the tracing paper. Very often lines of rivers, boundaries, sea and air routes, are more prominent than the coastlines themselves. The original from which the tracings are taken should be as free as possible from such distractions, and in any event the teacher needs to direct attention to the "danger spots" such as Gibraltar, Suez, the Skaggerak, or the Persian Gulf where the pencil is prone to follow the wrong line. These points, and others of a similar character, and the tendency to "print" from a tracing inside out are the principal faults to guard against, but when the outlines are learned from practice children soon become proficient, and readily drop into the habit of quickly and neatly producing a set of outlines ready for use. Tracings once made, can be kept ready to hand and used many times over. To prepare two or three outlines in a slack moment becomes a matter of course, and there is no need for preparation of outlines to consume lesson time which is more urgently required for other matters.

Children who have been well taught in their earlier days to become thoroughly familiar with the basic shapes of map outlines more readily pick up the technique of freehand sketch map drawing later on in school life.

* * * * *

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[1] This feature of visual perception is known as "The Law of Closure". See: Koffka, *Principles of Gestalt Psychology.*

REPRESENTATION OF DATA

On these outlines information is shown in the form of printing, symbols, shadings, lines, or combinations of these.

Maps are of two kinds :

1. *Non-quantitative maps.* These are maps which show locations or distributions only but not quantity—*chorochromatic* is the term usually applied to maps of this kind. In America they are called more simply " colour-patch " maps. Distributions are shown by colour as in the land utilisation maps, or in varying tones of grey (Fig. 21). Symbols are employed to show limited distributions where shadings would be inappropriate or difficult, as in the case of a map showing the occurence of mineral resources with several varieties close together in the same area (Fig. 21). There is a

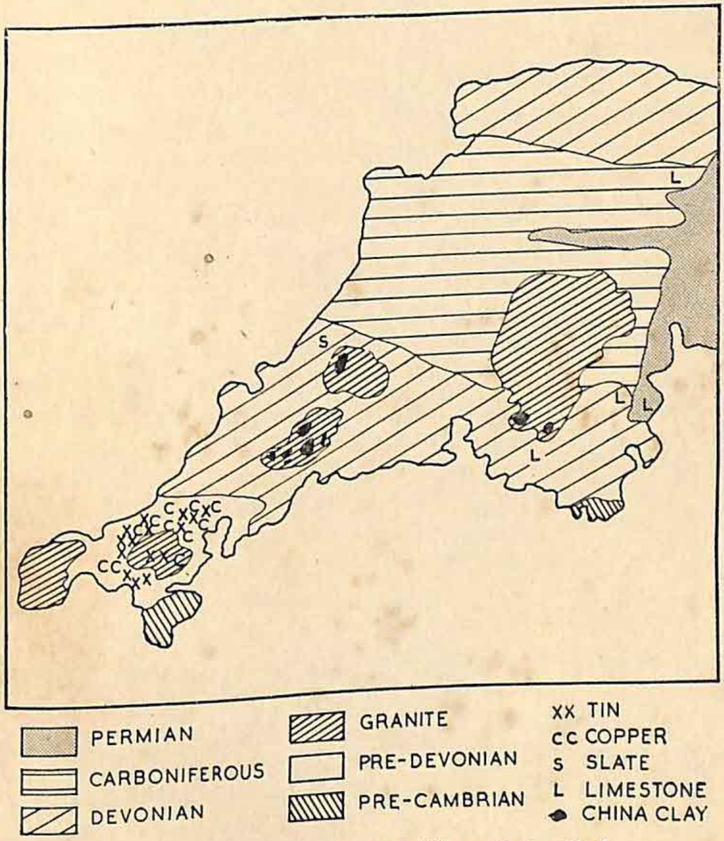


FIG. 21. Chorochromatic map with symbols added.

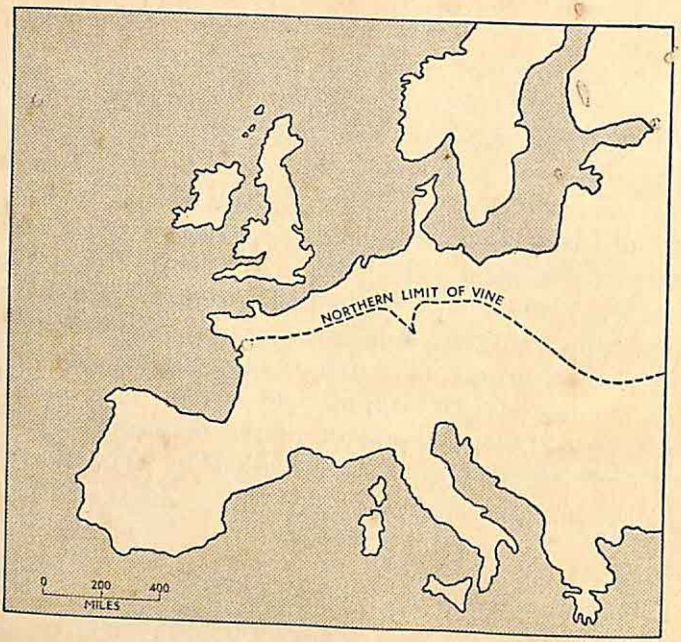


FIG. 22

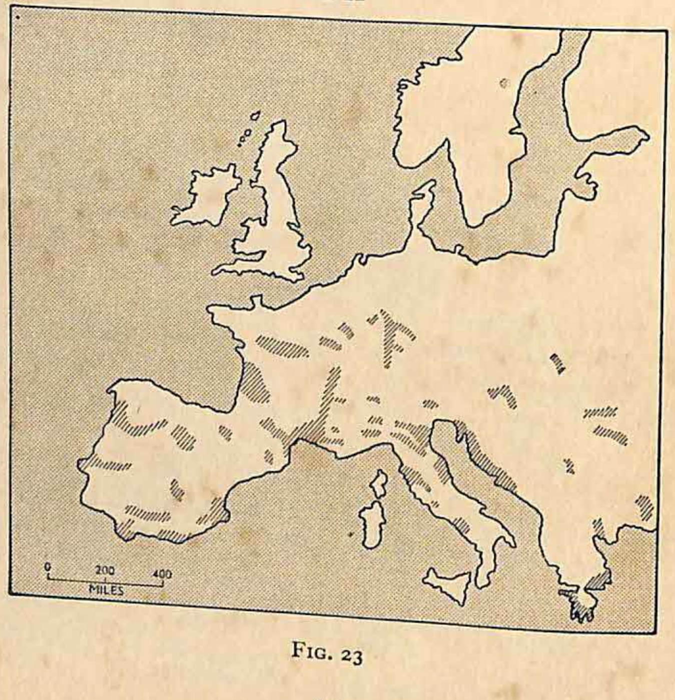


FIG. 23

practice which shows distributions (i.e. of a crop) by lines indicating the northern or southern limit. Although there may be occasions when this type of map has its purpose in adult use, it means very little to children. For them, distributions are more realistically shown by shading the area where incidence occurs. (See Fig. 22 and 23.)

2. *Quantitative Maps.* These maps show distribution and quantity also in two principal fashions:

(i) By means of lines running through places of equal value, e.g. equal temperature (isotherms), rainfall (isohyets), height (contours), etc. These are called *isopleth* maps. (See Fig. 24.)
(ii) By means of shadings of areas of equal densities or concentrations; these are known as *choropleth* maps. (See Fig. 25.)

There is a technique which combines the two, in the practice of shading the intervals between the isopleths in certain maps, as for example in some maps of temperature or rainfall or relief. The principal limitation of the isopleth map lies in the fact that intermediate values between the lines are not represented so giving an impression of "stepped" or terraced distribution which is not wholly true. The same difficulty appears in a somewhat different form in the choropleth map where the statistical data of the distribution is collected by administrative areas, i.e. a parish or a county or a state. If these areas are then shaded according to this value some inconsistency in the pattern is bound to arise for it is most unlikely that the distribution is even throughout the area.

The shading used in quantitative maps requires more careful consideration than in the case of those which show distribution only. There are specific psychological associations with particular types of shading. In monochromatic shading the general principle to be observed is that the shading should vary progressively from light to dark according to the increasing density of the distribution. This can be done by working from white through tones of grey to black, or from white through lined shadings of different spacing to black, so creating an impression of increasing depth. In either case the type of shading should be homogenous to give an overall gradation of density (Fig. 26). This is not given merely by changing the pattern of shading, i.e. by changing from horizontal to oblique shading without altering the distance between the lines,

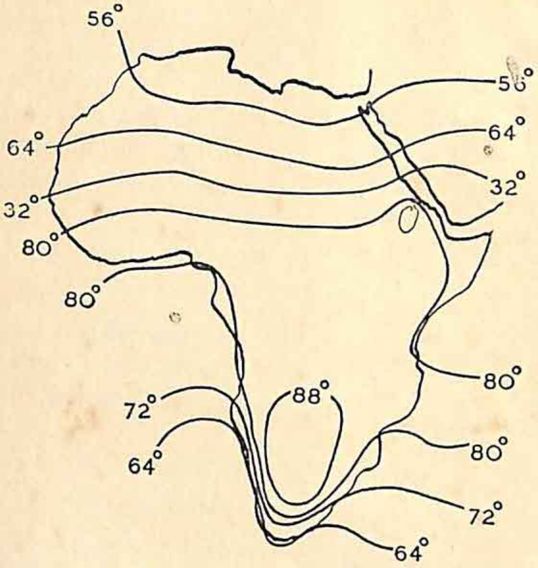
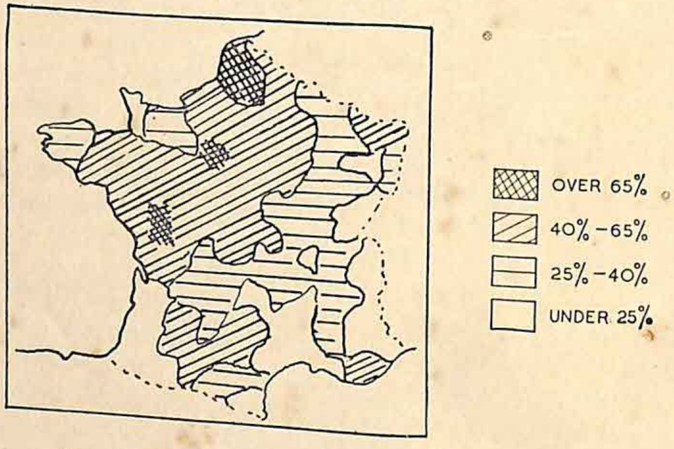


FIG. 24. Isopleth Map.



By courtesy: Methuen & Co.

FIG. 25. Choropleth Map, showing the percentage of agricultural land in each departement.

or indiscriminately mixing the types (Fig. 27). It is quite legitimate however to use dots widely spaced in the plain shading to indicate areas of very low density, for white alone gives the impression of no distribution at all.

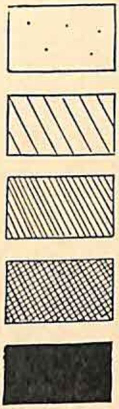


FIG. 26

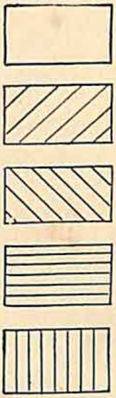


FIG. 27

If colour is used, even greater care must be taken to preserve the proper psychological associations. The "synaesthetic" properties of colour are discussed in Chapter 8 on page 179. The application of this principle to maps is particularly relevant to the impression which they make. Thus the various shades of red and blue, the "warm" and "cold" colours are traditionally used on temperature maps to convey feelings of heat or cold. The association of blue with water is also common throughout cartography. Deep blue is used for the heavier values in rainfall maps, graded down to paler shades and finally to pale yellow or fawn to suggest aridity in areas where rainfall is negligible. For relief maps, the gradations of green and brown have been carefully evolved over a long period. The effect must convey the transition from low to high ground. This is done by employing graded shades of colour, but not necessarily from light to dark in each case, for this would give a top-heavy impression where the hues change. This can be avoided by working from dark to light with one colour and reversing the sequence from light to dark in the next. This is seen in relief maps where the darker shades of green normally represent the lower ground, whereas with the brown the shading runs from light to dark. In spite of the unavoidable inconsistencies in this

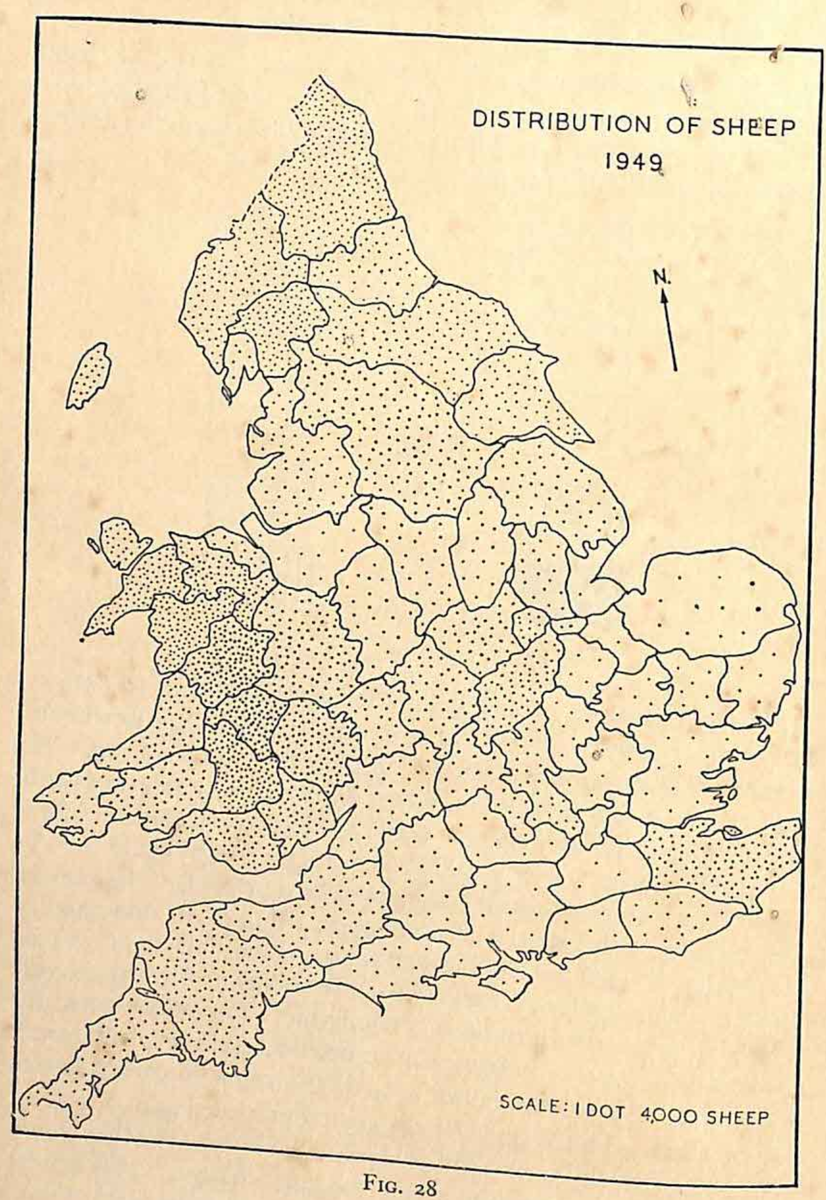


FIG. 28

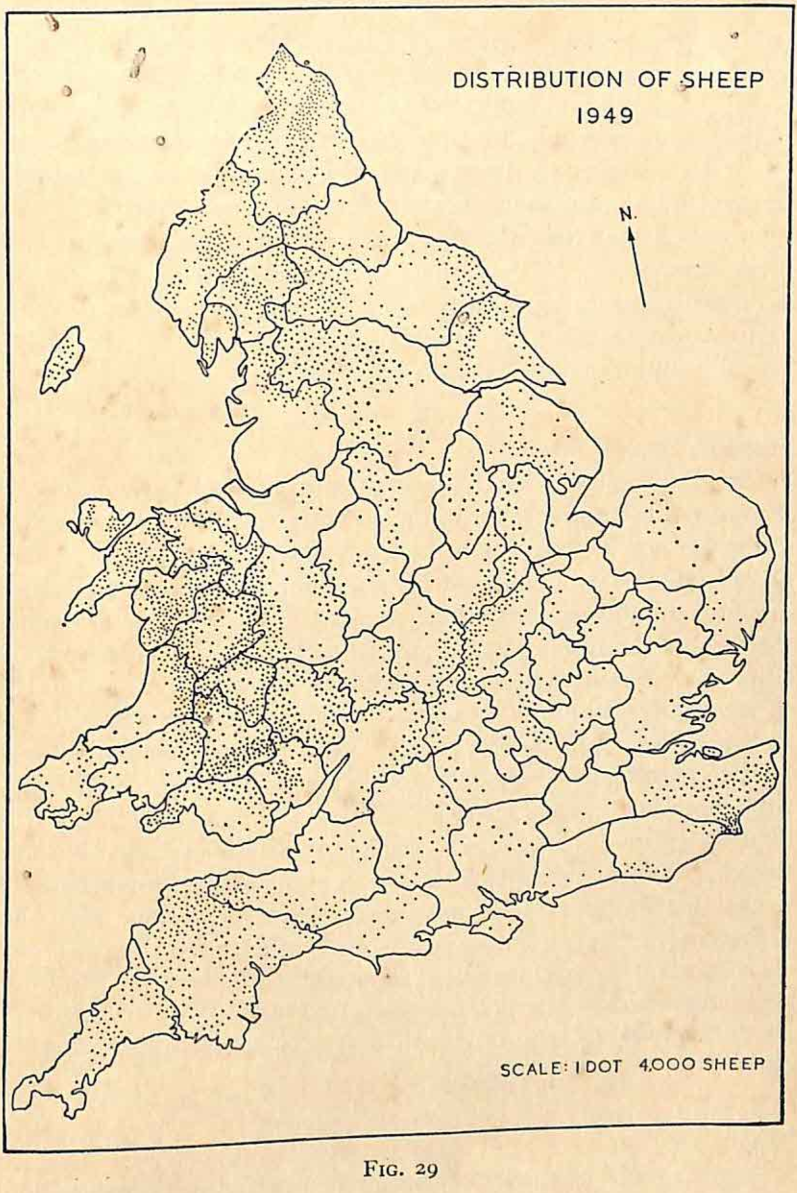


FIG. 29

case, as for example where green invariably suggests extreme fertility in the lower areas which may not necessarily be so, the overall impression is sufficiently near the truth to be acceptable, and certainly very much nearer than other less valid colour combinations. Similar colour associations and similar rules of grading are appropriate for other distributions; and a more pleasing and balanced effect occurs when colours are chosen in accordance with these conventions. These established practices should be taught to children, for indiscriminate use of colour by them can produce some very unsatisfactory combinations which are neither psychologically sound nor aesthetically pleasing.

STIPPLE MAPS

The artificiality of both isopleth and choropleth methods of mapping quantitative distributions can be partially overcome by using the dot method, with each dot representing a fixed value. Distribution is then achieved by employing the requisite number of dots, suitably spaced. One method is to space them evenly throughout the administrative area from which the data is obtained (Fig. 28). Another is to use the same number of dots but to vary their spacing within the area according to known physical or other features (Fig. 29). This probably gives a result which is more nearly correct but it depends upon an element of personal interpretation for an accurate result. Where the density is heavy it is legitimate from the psychological point of view to run the dots together to form solid black, thus giving the desired impression of heavy distribution. It is possible to argue that since each dot represents a given quantity then one ought to be able to count them, and no doubt this is strictly correct. In school use however, meticulous accuracy is not always so urgent, and one may perhaps instil the spirit of map usage without necessarily emphasising the mechanics of cartography.

MAPS IN USE

Maps should be made and used when it is clear that they fulfil a need, to illustrate geographical matter which comes in some other form. At first the needs are simple; they help children to visualise space and direction, to add substance to a narrative which is read or spoken. The maps too are simple; they consist of the outlines, with the appropriate place-names upon them, and very little else. From this children should develop the habit of always looking up in the atlas the name of any place which appears in their own reading, or which comes to them incidentally in the course of normal routine. Atlases should always be open on the desks, ready for use. I cannot think of any lesson in geography which may not be improved by periodic reference to the atlas. Children should come to regard it as their constant reference book. They should be familiar with its maps and trained to select the one they need without waiting for the direction of the teacher. They should be accustomed to search for the information they need. If their early excursions into regional knowledge consists, as it so very often does, of an insight into the lives of children in other lands, then everything they read or hear about these lands should be mapped, in conjunction with the texts they read and the illustrations which they see. No opportunity should be lost to stimulate interest in, and familiarity with, the technique of using the atlas. Shipping and air intelligence supplies endless occasions for using the atlas. Children can adopt their own ship or air line and follow its journeys across the world, mapping its routes, the ports at which it may call, the seas which it crosses, the countries it links. If access to such information is difficult to come by (although there is no reason why it should be), then imaginary journeys can be devised after the manner of those in chapter 3 on page 51, but this time covering the globe instead of the one inch map. The atlas should be an open book to children by the first year of their secondary school.

Children should not make their maps with the idea that once completed a map is finished and done with. On the contrary, it is but the beginning. The information which the map contains is compared with that from other sources; or a description is compiled, reading the map as one reads a text; or two maps are placed side by side and appropriate inferences drawn from what they have to tell. The relationships stand out all the more clearly if the two maps, or indeed a set of maps, are drawn upon tracings and superimposed upon one another. The study of geography is never merely a matter of cataloguing so many facts; the essence of it lies in the inferences and the conclusions which may be drawn from an intelligent appraisal of what the facts reveal. This principle is never more true than in the case of work with maps.

The making of them is but the mechanics of the matter; the real task is to interpret their meaning.

* * * * *

SKETCH MAPS

Maps found in the atlas show their facts separately. Each is devoted to a specific distribution—rainfall, temperature, topography, grain crops, mineral resources, and so forth. Sketch maps on the other hand show a variety of facts chosen so that the combination of them all reveals some particular geographical result. If atlas maps are regarded as general and comprehensive, sketch maps by contrast are intended each one to describe a particular geographical situation.

Sketch map drawing is designed to emphasise those few chosen features which are relevant to one another. Therefore, a certain spontaneous simplicity, and devices of draughtmanship are characteristic of sketch map technique. In many ways they are more properly regarded as diagrammatic rather than cartographic. As a diagram may simplify and emphasise certain features of a picture, so a sketch map simplifies and emphasises some few features chosen from the maps of the cartographers.

When children come to make sketch maps of their own they are already familiar with the general pattern of map outlines and with the methods of representing information upon them. In sketch maps they now simplify their coastlines in bold freehand strokes, not striving after an accuracy which is out of place in this type of work. Similarly, they simplify and conventionalise the map-language which they employ. Thus a sketch map becomes a form of cartographic shorthand which helps a child to visualise the geographical pattern which the map describes, and helps him also to memorise those features of it which are associated together.

EXAMPLES OF SKETCH MAP DRAWING

Let children be trained to build up their sketch maps in the same systematic order each time. They then become accustomed to seeing their maps grow according to a logical development, and this in its turn helps to avoid the congestion which tends to arise when printing, symbols, and shadings compete for positions within a restricted space. The order I suggest is as follows:

1. The limits of the area—coastline or other boundaries.
2. One or more meridians or parallels.
3. Such physical features as may be necessary.
4. Names of places.
5. Other printing.
6. Route-lines, or other arrows.
7. Shadings, or other representations.
8. Key.
9. Title.

These points are illustrated in the map of the Argentine shown in Fig. 30.

1. The coastline is bold, formal, drawn with a heavy pen line. Coastlines should always be the most dominant for they set the shape of the figure within which the map grows. If they are masked by other data, or surrounded by lines of equal weight the map loses its character altogether.

2. Parallel 30 degrees south and meridian 60 degrees west are put in with pecked lines of less weight.

3. The only physical features necessary on this map are the Andes and the three rivers. The Andes are shown by heavy, broken, conventional lines to suggest a formidable barrier. The lines for the rivers are plain lines, very much thinner than the coastline, so that they do not form a shape which leads the eye away from the main figure.

4. Names of places are kept to the very minimum. In this case, the positions of the six towns are fixed ; therefore they go in first with a large dot and the initial letter of the names. If the whole names are written, they cover the map and leave room for nothing else. Skilful abbreviation is a most necessary accomplishment for children to acquire if their sketch maps are to be well done. The explanation of abbreviations is put into the key. With the names and locations of these towns fixed, it is possible to see what space there is available for other necessary names. Bahia Blanca, Valparaiso, and Uspallata Pass can be printed in full for they are out of the area which is likely to become congested. Argentine and Patagonia are named in capitals where space permits ; these names are not tied to one particular spot, therefore they should go in later.

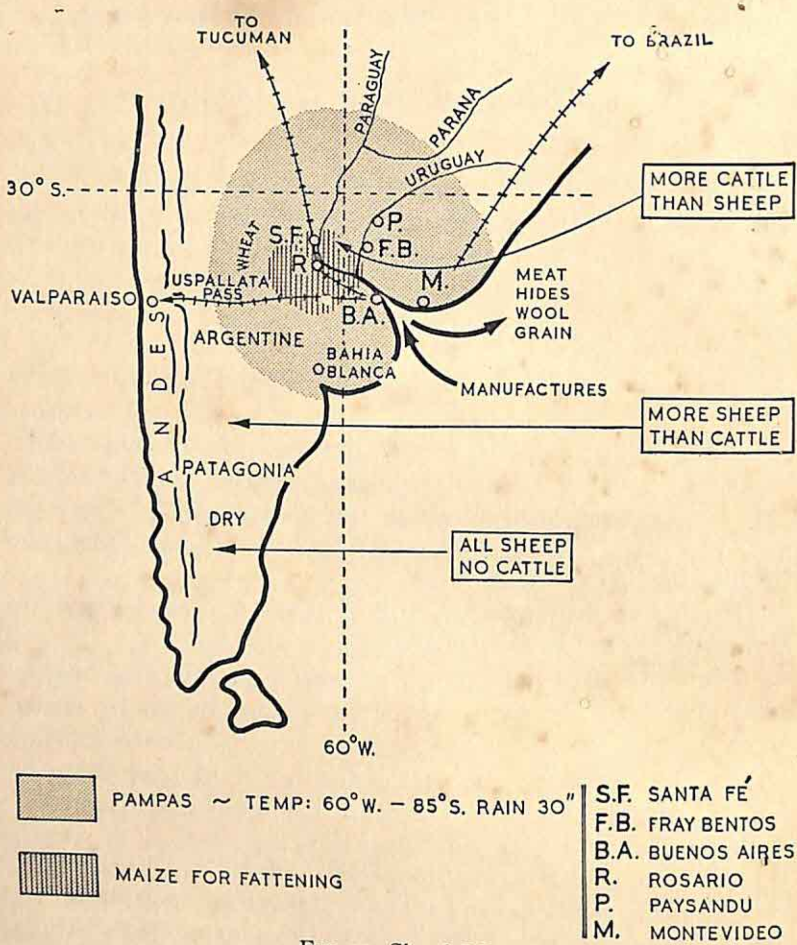


FIG. 30. Sketch Map.

5. Other printing not immediately concerned with locations should be kept away from the land area so far as this is possible. An unsightly jumble of words is very displeasing. On this map, printing relating to economic matters is put neatly in frames at the side. Where appropriate, leader-arrows run from the printing to the proper place upon the map. These arrows are drawn with light lines which do not unduly dominate the balance of the map. Other printing, which must appear on the map itself, e.g., the words " wheat " and " dry " are put in the places to which they

refer. It is a good general rule that printing should be parallel with the bottom of the map wherever possible, except for those cases where the printing must be done vertically if the distribution demands it (as in the case of " wheat "), and for certain specialised instances such as the names of rivers, where the name must obviously follow the river-line. Printing should be done with the mapping pen for preference, or sharp pencil, but *not* with a coloured pencil. The point of the coloured pencil is never sharp enough to do printing neatly, and more important than this, colour should be reserved solely for use in showing distributions or to enhance visual perception by giving emphasis to certain chosen features.

6. Route lines on this map are shown by conventional rail representations with the destinations printed clear of the main map. Incoming and outgoing shipping lines are shown by two heavy arrows in the appropriate place, with a brief legend mentioning the principal imports and exports.

7. The shadings necessary are these: the area of the pampas, wheat, and maize. The principal area is shaded, *not* with lined shading which clashes badly with printing, but with very light, close shading which still preserves the legibility of the printing

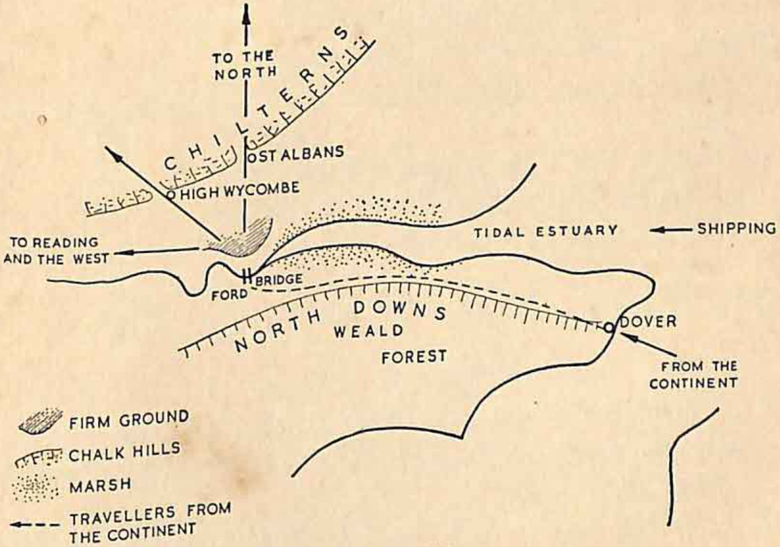


FIG. 31. Sketch Map.

G.T.G.

beneath it. If children are trained to do this with the *side* of the soft coloured pencil and not the tip of the point, a perfectly even surface can easily be obtained. If one distribution is superimposed upon another, as in the case of " maize ", it is possible to differentiate between them by using lined coloured shading for the smaller area, so long as it is not too extensive. Here, the maize area is outlined with vertical shading in a darker green than the surrounding pampas. If too many shadings are likely to occur within a small area to spoil the appearance of the map, then one or more of the distributions should be shown by name to make a contrast. For this reason, the area for wheat is named, and not shaded.

8. The key explains the two shadings used and the abbreviations for the names of the towns.

9. The title is added, as always, to complete the map.

Fig. 31 is an example of the simpler sort of diagrammatic sketch map designed to show the salient factors in a geographical situation with the greatest economy of line and printing. Children should develop the habit of illustrating their own work with simple visual statements of this kind.

BIBLIOGRAPHY

G. H. Dury, *Map Interpretation*, Pitman, 1952.

F. J. Monkhouse and H. R. Wilkinson, *Maps and Diagrams*, Methuen, 1952.

I. J. Curnow, *The World Mapped*, Sifton Praed and Co., 1930.

H. L. Winterbottom, *A Key to Maps*, Blackie, 1936.

H. Fordham, *Maps : Their History, Characteristics, and Uses*, C.U.P., 1930.

T. W. Birch, *Maps*, Clarendon Press 1949.

ARTICLES IN *Geography*

T. P. Nunn, The Teaching of Map Projections, Vol. 9, 1917.

E. G. R. Taylor, Sketch Maps, the Shorthand of Geography, Vol. 14, 1929.

W. G. Balchin and W. V. Lewis, The Construction of Distribution Maps, Vol. 30, 1945.

N. Pye, Some Problems in the Presentation of Map Projections, Vol. 34, 1949.

Campbell, The Early Development of the Atlas, Vol. 34, 1949.

H. C. Prudden, Blackboard Outline Maps, Vol. 38, 1953.

Geographical Association, Essentials of a Good Secondary School Atlas, Vol. 38, 1953.

SECTION III

Principles of Geography Teaching

CHAPTER 5

GENERAL PRINCIPLES OF CLASS-ROOM PRACTICE

A school is a shop where young wits are sharpened.

J. A. COMENIUS

FROM the foregoing chapters it is possible that the student may have noticed certain principles emerging which enable children to learn more effectively.

PRINCIPLES OF LEARNING

We might say that these principles are embodied in the supposition that *learning tends to take place when certain conditions are satisfied.* This appears to happen:

1. *When the* PURPOSE *of a lesson or a series of lessons is apparent to the children who are taking part in it.*

This is a basic principle of all educational achievement, and indeed of any kind of human effort. Few things are so soul destroying as time and energy spent on tasks which are clearly purposeless. The classic example of keeping idle men occupied by digging holes and filling them in again is but one instance, possibly rather overplayed, of the frustration which arises from unrewarding effort. Although work in schools is rarely so bleak as this, there are many occasions in education when the purpose of a task is clear enough to the teacher but quite obscure to the children, and this is not really surprising considering the difference in their background and maturity. It is hardly to be expected that children will see so clearly as their teacher the ultimate purpose of their schooling, and it is small comfort to them to learn that a tedious task will be useful later on. But they can very often be more fully informed about the immediate purpose of a lesson. So often do they see their lessons as merely isolated academic entities which have little relation to what has gone before and giving small indication of what is to follow. There is really no need for children to be kept working so completely in the dark. It does not make for inspiring work, and there is much more incentive for them when their job is set out squarely in front of them before they begin. There is a sense of positive achievement if it is then split up into manageable portions which can be successfully completed in a short time.

2. *When the lesson material is presented in a manner which appeals to the learner, and which stimulates his* INTEREST.

Again, this basic principle is difficult to refute ; it is so perfectly evident that one is prepared to pay more attention to those things which are interesting, than to those which are not. But the world of education has long been divided on the wisdom of accepting this principle as a measure of good teaching. On the one hand there are those who accept it unreservedly, seeing in it a stimulating device for attracting unwilling schoolboys towards unwelcome tasks. On the other hand, their opponents argue that interest is of small consequence in the serious business of education. Education is a preparation for life they will say, and life promises to be stern and unrelenting. Therefore, one of the marks of a sound education should be a training in the discipline of hard graft, enduring the burden of toil whether interesting or not. So does one prepare for the rigours which have yet to come.

There is much truth in both of these arguments, and if we look at them a little more closely we may see that they are not quite so much the antithesis of one another as they might seem. Hard work is not inseparable from a lively interest. When children become absorbed in a job that interests them, they are prepared to concentrate far more intellectual effort upon it than they will summon up for a task which has no interest for them. For its successful completion they will endure the drudgery of repetitive mechanical work which otherwise would bore them sadly. To succeed in a task which is difficult has a satisfaction all of its own. The pugnacious tenacity inherent in most children is challenged by obstacles (so long as they are not insuperable) and they will work to surmount them, provided that they can see that the work is worth doing, i.e. if it arouses their interest. In this interpretation, interesting things are seen to be those things which really *matter*, not those which merely tickle the fancy temporarily. If a job does not possess the incentive of being worth while, interest wanes and effort is dissipated in boredom.

It is quite possible therefore for habits of industry and perseverance to accompany work which is interesting. There is no need to exercise the mind upon austere fare in order to develop these very admirable qualities.

3. *When children are* ACTIVELY ENGAGED *in* SEARCHING *for information instead of waiting for it to come to them.*

There are several reasons for this. In the first place the actual process of seeking and sifting means that those so engaged are mentally alert; they must be, for if they are not, then the search finishes abruptly. Secondly, being alert, the facts found by the search tend to stick in the mind and are remembered far more readily. Thirdly, searching reveals unlikely possibilities and new interests hitherto unsuspected. And fourthly, children are by nature equipped with a positive liking for searching. Inherent in their mental composition is the instinct of curiosity—the natural impulse to seek and find. Nowadays the psychologists are less attracted by the term "instinct" than they used to be. They speak more cautiously of a "tendency" to behave in this manner or that, an "urge" or a "hunger"—in this case, the "hunger" for constant movement, intellectual as well as physical, which reveals to a developing child the secrets and the mysteries which inhabit his world. Let the psychologists change their jargon if they wish; the fine distinctions do not matter very much here. For the teacher of geography, small boys remain as consumed with curiosity as ever they were.

4. *When work is so arranged that it meets the* INDIVIDUAL APTITUDES *and abilities of the children concerned in it.*

If one thing stands out more clearly than another from modern educational research, it is the very notable difference that exists between individual children. They are in no way alike, either in intellectual capacity, in their method of working or the rate at which they work, in their inclinations, their abilities, temperament, or potential achievement. No doubt it is possible to reduce the apparent differences by grading children into roughly homogeneous groups, and then organising their work to meet the various levels of attainment.

When these conditions are present, it may be argued, learning is likely to be effective. Conversely, it is hindered when they are absent or when they are deliberately contradicted. This would appear to be soothing news, and it might logically lead us to the comfortable conclusion that all we need to do is to put children into situations where they may learn and then discreetly withdraw into the background. Unhappily this does not always appear to be the case. When a young teacher at the beginning of his career finds children who persistently show a marked resistance to any appeal of any kind, who betray no interest in what they are doing, and with little desire to seek any further than they need do, he is inclined to be somewhat sceptical, and to assume that these fundamental principles have no substance in practice. In fact this is not the most intelligent appraisal of the situation.

Learning and Teaching

The answer lies not so much in the limitations inherent in the principles themselves as the way in which they are applied, that is, in understanding the subtle difference that exists between learning and teaching. It is not enough to say that children teach themselves when they are put into a " learning situation ". This they are ill-equipped to do by reason of their lack of maturity, lack of skill in the technique of study, lack of working knowledge, and as often as not, lack of inclination.

Something more is needed than the provision of a suitable climate. For, although information can certainly be picked up that way, it comes haphazard and incidentally, much of it irrelevant, much of it of doubtful educational value, and in all probability, acquired in a very uneconomical fashion with much waste of effort ; and secondly learning does not consist solely in acquiring knowledge. It is a process of maturing and of development, which involves manipulating ideas, and forming of attitudes.

The Teacher's Part

Both of these limitations can be remedied by introducing a missing element—the driving force of the teacher. It is his job to translate these principles into practice. Where the purpose is obscure, he clarifies it by simplifying a whole task into a number of subsidiary tasks each with a limited and recognisable purpose.

Where the second principle in our list states that children learn best when they are engaged in work which interests them it does not mean that interests necessarily appear spontaneously of themselves nor that children are free to pursue their every fancy as the mood takes them. Children are not always very original. Their interests are often slow to emerge, and these they pursue in a trivial and perfunctory fashion if they are left to themselves. There is little educational virtue in mere superficial dabbling. It soon loses its kick, and the children themselves are the first to be bored with lack of definition. But they are quick to respond to suggestion and a little forceful direction from a teacher who of his wider knowledge and more mature judgment knows which of the many interests are likely to turn most profitably to educational use.

He can organise incentives ; he can associate the less exciting material with that which has a more immediate appeal ; he can direct the energies to increase the possibility of success and minimise the risk of failure, which in itself helps to keep interest alive.

Not only does all this give a stimulus to those interests which children may already have, but under the rigorous impetus of a powerful personality it is not at all unusual for those children who do not appear to have any interest in anything, suddenly to discover interests which formerly they did not possess. For the teacher's personal enthusiasm counts for so much. If children like him they are quite ready to translate their respect for him into an interest in what he has to offer.

Similarly, the children's personal activity and searching for information can be a profitless task if it is not properly directed. But the teacher can save his pupils hours of fruitless seeking for knowledge which eludes them. Although he ought not actually to supply information if sources are available he can show them where to look and how to select. He can elaborate anything which is imperfectly understood by pointing to the relevant and rejecting the unwanted, but the most skilful teacher in the world cannot make his pupils see the significance of information which they do not possess.

THE TEACHER IS THE DOMINANT FACTOR

At the teacher's direction children may learn with economy of effort and time. Without it, they waste both and lose heart. Children enjoy system and logical, orderly arrangement, and this the teacher can give them. They are not so good at creating it for themselves but they recognise it when it is provided for them and work the better for it.

The teacher's part may be summed up in this fifth principle : that learning tends to take place

5. *When the direction of the teacher focusses the children's attention upon the most significant items in a learning situation.*

His function is really to teach his pupils how to learn. When habits of study are formed, he may withdraw a little more and show the older and more able pupils how to teach themselves.

My general conclusion is that to provide children with opportunity for learning is not enough.

It is possible for children to learn, and to achieve very little; this happens when the direction of the teacher is missing.

It is possible for a teacher to teach, and for the children to learn nothing; this happens when the principles of learning are ignored.

It is possible for a teacher to teach, and for children to learn under his direction, and later independently; this happens when the teacher's technique is based upon these principles and when his skill is informed with personality.

LESSON EXAMPLES

The core of successful teaching is still the normal routine lesson. These examples which follow are typical of such lessons where the teacher has had some regard for the principles of learning.

1. *First Example*

An Indian Snake Charmer. This lesson was given to children of 10 years of age in a co-educational primary school. Their previous background to geography had come from the lives of selected persons in different countries. They had already seen quite a variety of such persons. They were accustomed to using the atlas maps of the countries in which they lived.

This lesson was one of a series in which they made the acquaintance of Indian characters. They had already met Jag Bandhu the Bengali peasant, and Lapchong Lama, a Darjeeling cooly. Now Vija the snake charmer takes them into the bazaars of the cities.

The lesson is arranged in this form: First the teacher refers back to the Indian personalities known to the children. They recall some of the principal points which emerged on the previous occasions. A link is established in this manner, putting the lesson in its proper place in the series.

From this point the teacher takes up the description of Vija the snake charmer, his clothing, the turban, the yellow dhoti which is the inevitable mark of his trade; his family, introducing Anandan the small son who is the same age as the children in the class, to establish a community of feeling between them. The tools of his trade are described—the forked stick to capture the cobra by pinning it down behind the head; the forceps to draw out the fangs; the basket in which the snakes are kept; the reed-pipe to make music. Briskly the description moves on to describe the noise and hustle of the bazaars; the heat and dust within the little circle of tense spectators; the *tour de force* of the performance, the music and the charming. The snakes are returned to their basket; a collection is taken by Anandan. The family move on to the next bazaar. They lead a nomadic life, the charmer carrying a pole across his shoulders, the basket of snakes strung at one end; a bundle of possessions at the other. The forked stick is his staff.

[I recall seeing this lesson given by a teacher unusually skilful with narrative. His description was a vivid and enduring picture in words, illustrated at the same time with quick line sketches in chalk upon the blackboard. As new words appeared in his narrative he wrote them up at the side of his sketch, large enough for all to see (turban, dhoti, cobra, reed-pipe, bamboo, basket, bazaar, nomad). While his description and his sketching continued he kept his class engaged with questions, leading them on as well as describing, keeping them mentally on their toes. ("What is this I am sketching now? A pot? No, not a pot. A basket? Yes, it is. And what is inside it do you think? . . . Now he makes his music with this pipe, I will draw it in. What is it made of? Reed? What sort of reed?" and so it continues.) He had also more spectacular illustrations. From amongst other interesting articles assembled for the occasion, he exhibited a turban, a dhoti, and a pipe.]

When the description is finished the blackboard is removed from sight and with brisk questions, he makes the class recapitulate the main points which he has taught.

Three children then dramatise a short scene. A snake is stalked and pinned to the ground with the blackboard ruler; it is incarcerated within the waste-paper basket; the snake charmer sits cross-legged before it, surrounded by a circle of admirers. The circle breaks up and the nomads depart on their way.

Next, the children write a short description of the events, using as the foundation of it, the blackboard sketch and the word-summary which were made during the descriptive part of the lesson at the beginning. They illustrate these accounts with their own sketches in coloured pencil. Finally to round off the lesson in the last few moments, the student brings the class together, refers back to the nomadic existence of snake charmers, their habit of moving from place to place. With the wall map for the teacher and atlases for the children, they then pick out a few prominent places. Each child keeps a map for this series of lessons, a few features being added to it each time. These names are now put in.

Now let us see how the structure of this lesson conforms to the principles of learning which were mentioned earlier.

The PURPOSE is clear. It is to add yet another human sketch to the series which the children have had, to bring alive the varied pattern of Indian life.

INTEREST is present in abundance. The description is obviously enhanced in this case by the personal knowledge and the very special position of the teacher. But it would be quite wrong to imagine that his nationality was alone responsible for the keen interest which the children displayed. No doubt this helped in the first instance, but it was quickened by his marked skill with narrative, by the excellence of his quick, simple, but very lucid, blackboard sketches, and by the enterprising use of novel and authentic objects in illustration. It was further sustained by the infinite variety of

ACTIVITY which was embodied in the planning of the lesson, including the activity of the children. I emphasize this matter of *variety* of occupation. It is not only necessary for children to be actively engaged in a lesson ; the nature of the activity must change from time to time. This shifts the emphasis ; it quickens the tempo and keeps the children mentally on the alert. A lesson which lacks variety lacks colour also. Uniformity of pace and of proceeding makes a lesson drag in a sombre, pedestrian fashion which children find very tedious.

In this lesson there are no fewer than eight changes in presentation or occupation :

1. There is the personal exposition by the teacher.
2. This is illustrated by blackboard sketches and a word summary.
3. It is illustrated also by three well chosen exhibits.

4. During this exposition the description by the teacher alternates briskly with questions, and answers by the children.
5. There is the pause for recapitulation with the blackboard covered, during which the onus shifts entirely from teacher to children.
6. There is the brief dramatisation which strikes an entirely fresh note.
7. There are the short summaries written by the children, which serve to consolidate the substance of the lesson, and also, to settle the children down after a lesson which was vigorous and compelling.
8. Finally, a quick reference to the atlas, to locate a few prominent places and to mark them on the map.

These items were divided in time in roughly this manner :

(i) The illustrated exposition	(1-4)	15 minutes
(ii) The recapitulation	(5)	5 minutes
(iii) The dramatisation	(6)	5 minutes
(iv) The written work	(7)	15 minutes
(v) The reference to the atlas in the last few moments.		

Although lessons ought not always to be governed inflexibly by a rigid time schedule, this example does show how variety can be achieved in a forty minute lesson, provided that the teacher plans before hand approximately how long each item must take.

Quite apart from items of exact factual knowledge which they may learn, children will recall from a lesson of this nature, a more general impression of life in the bazaars of India. The snake charmer is the focus which holds their attention, but he is only the vehicle through which children come to share in the experience of life in his setting. They endure the heat and hear the cries and sense the constant press and turmoil. For a few moments they get the feel of the scene from this element of personal participation, and it remains with them as a part of their being.

In a final comment on this lesson, it should be mentioned that over-all there lay the personal influence of the teacher. The children recognised of course that he was on very sure ground, but they were quickly infected too by his obvious zest for his work. His enthusiasm became theirs, and this set the pattern for the lesson which followed.

I give this lesson as a practical example of one which was carefully planned on sound psychological principles; put into practice with considerable technical skill, and directed by a teacher of vigour and personality.

The lives of individuals or real human situations, make good starting points for geographical studies. An extension of this technique is quite natural perhaps in the secondary modern schools. It is less usual, though none the less profitable, in grammar schools too. Thus instead of studying " Fishing in Britain ", we may take " A Voyage with McGovern, a Trawler Skipper " as the centre of what is virtually the same subject matter, but when viewed through the window of his wheel-house, it has a more urgent quality. Instead of " Cattle-rearing in the Argentine ", " A visit to an Estancia " based upon an authentic account lays before us a typical *sample* of the life on a ranch in the pampas. The term sample is really a significant word. It implies that we turn round and approach our subject from a different angle, by taking an intimate look at a series of representative small samples within a region, or a country or a continent, and by piecing them together, developing a typical cross-section of the area as a whole. For most children this is a much more realistic approach than a synoptic view of a whole region on systematic lines. In secondary modern schools, it is possible that a well-chosen series of samples will give a perfectly adequate impression of world geography.

2. *Second Example*

Trawlers and Drifters. This lesson was given to secondary modern school children of 12-13 years of age. It came as one of a series of lessons covering occupations in Britain. McGovern, the trawler skipper was the central character of the narrative which gave the substance of the lesson.

The lesson arrangement is as follows:

Atlases are open on the desks. The children have writing materials and a prepared outline map of the east coast and the North Sea. The teacher begins with two illustrations which show trawlers at their berths at Grimsby, and drifters at Lowestoft. The pictures are displayed; the class is questioned closely on what they reveal. When the general scene is clear, the teacher leads his questioning to the registration letters on the funnels which disclose the home ports of the vessels. These are listed on the blackboard in two lists, one for trawlers, one for drifters (Fig. 32).

FIG. 32

Tabulated Summary for Lesson 2

	Trawling	*Drifting*
PORTS	Hull Grimsby etc.	Yarmouth Lowestoft etc.
METHOD	At the bottom, with trawls	At the surface, with drift-nets
FISH	Cod Haddock etc.	Herring Mackerel etc.
FISHING GROUNDS	Distant— Norway Iceland etc.	Near— North Sea Dogger etc.

The trawler skipper, McGovern, then enters the story ; his life is briefly described ; his home, his job, his relationship with the owners and with his crew ; his powers and responsibilities at sea. His trawler is then described putting to sea for a spell of fishing, and a short, carefully-edited passage from F. D. Ommanney's *North Cape* is read, as an illustration. The destination is written upon the blackboard, and found in the atlas. The method of trawling is described, and illustrated with a diagram on the blackboard. The names of the fish caught by this method are added to the blackboard list.

There is a pause in the development of the lesson at this point to consolidate the ground covered, by quick oral questions which recapitulate the principal items taught.

As a contrast to McGovern's method of fishing, drifting is described, illustrated with another chalk sketch, and the blackboard summary in tabulated form is completed (Fig. 32), as the points occur in the teacher's description. To complete his narrative, a second short passage from *North Cape* is read, describing the return of McGovern's trawler to harbour after a long and weary spell at sea.

This completes the teacher's exposition, and there is a second pause here to recapitulate, the method this time being a progressive repetition of the narrative back to the teacher, told by several children in turn, each one taking up where the previous one left off.

The lesson now changes its character; there is a switch from description with illustration by the teacher to a set task for the children, to record the substance of the lesson in map or written form. They have prepared outlines of the east coast and the North Sea. The teacher gives precise instructions for the making of this map, and so that there shall be no doubt as to how it is to be done, he writes these instructions on the blackboard:

(i) Find in the atlas the names of all the places mentioned, and put them on the map.
(ii) Name the North Sea and Dogger Bank.
(iii) Show by arrows, fish coming *in* to the ports, and *out* from them to the cities.
(iv) Show by arrows, the direction taken by trawlers to distant fishing grounds.
(*a*) To Norway (*b*) to Iceland. (Complete map at Fig. 33.)

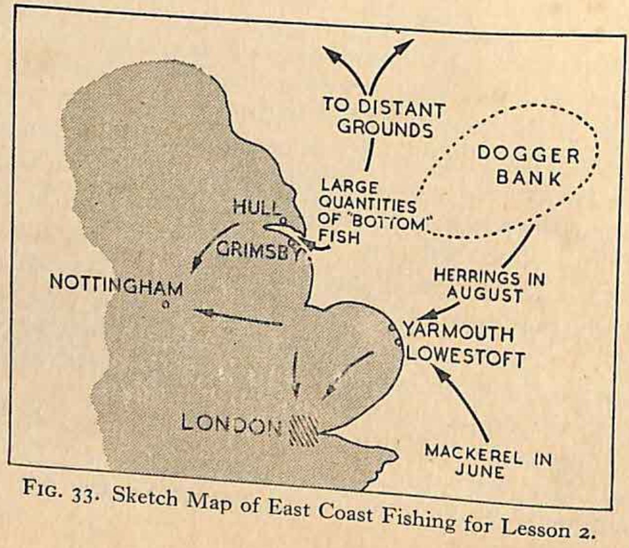


FIG. 33. Sketch Map of East Coast Fishing for Lesson 2.

When this is done, the children make their own summary in tabulated form, illustrating it with two simple sketches showing the methods of trawling and drifting.

The various parts of it take up roughly the following time :

(i) The introduction with the illustrations	5 minutes.
(ii) The illustrated narrative, including the brief recapitulation with questions	20 minutes.
(iii) Re-telling by the children at the end of the narrative	5-10 minutes.
(iv) Children's map	10 minutes.
(v) Children's written summary	10 minutes.

which gives an indication of the planning of the lesson, with sufficient latitude within a period of sixty minutes' duration.

There is the same sense of PURPOSE in this as in the previous lesson. INTEREST is awakened at the very beginning by immediate reference to the two illustrations ; it is maintained in the description by the robust passage from F. D. Ommanney's *North Cape* and by the blackboard sketches. VARIETY OF OCCUPATION is provided by (i) the narrative, (ii) illustration in three different forms (pictorial, the reading of a passage, and the blackboard sketches), (iii) two different methods of recapitulation, (iv) the map made by the children, (v) their written summary.

There is here sufficient interest, variety, and activity to meet the requirements of our first principles.

It is worth noting in this lesson, some of the points of technique which the teacher uses to apply these principles :

1. The opening has a compelling quality ; it captures the children's imagination immediately. It is a useful device to begin a lesson with sudden, forceful point which grips the attention—a telling phrase, a dramatic incident, or (as in this case) an appropriate illustration.

2. The sketches are drawn at the time when they are most effective—while the description is actually being given. The words and the sketches support each other. Diagrammatic illustration of this kind is always most powerful if the children can see it grow. It loses its force if it is drawn beforehand and displayed complete.

3. Similarly, the tabulated summary is built up as the teacher's exposition proceeds. The spoken words and the

written names appear together. It is never the same when a verbal description is made first, and the summary of it written up afterwards.

4. The teacher splits up his description into two portions. At a convenient point he pauses to allow the children time to recapitulate the main points in his story. Later there is a second pause to revise again, before going on to the next main part of the lesson. These pauses are important, for learning is a process that takes time, and in planning a lesson, time should be provided for children to assimilate. This usually means that they must go over the same material again, and possibly yet again, consolidating their position before passing on.

5. The method used to recapitulate in this lesson, is a re-telling of its substance. A very effective alternative is a short brisk test of ten words or so, throwing up into prominence the principal points which the teacher wishes to stress. If this is done, it must be so arranged that the questions are phrased to admit of only one word each in answer. These answers are jotted down by the children on rough paper, checked by them, correcting their own mistakes as they do so, thus noting the right version for the answer if they happen to have put a wrong one. This is properly regarded by the teacher as an additional teaching device to draw the threads together as it were. It is not a test at all in the accepted sense of the word, and if it is made so, then it fails in its purpose. It must not hold the lesson up; the teacher must not allow himself to be diverted into lengthy discussions on the rights or wrongs of the answers, nor to waste time checking marks and compiling lists. As soon as these formalities of testing are allowed to creep in, it consumes more time than it can justify and becomes an unwelcome intrusion in the lesson. It is better not to use the word " test " at all, for children shy away from it at once and set themselves on the defensive. It should be slipped in informally in the guise of a " quiz " or in other palatable form. Used in this way it is a neat and unobtrusive way of introducing variety.

This method of recapitulation was used on another occasion when this lesson was given. These were the answers to the questions:

1. Grimsby
2. Lowestoft
3. Dogger
4. Norway
5. Trawl
6. Otter-boards

7. Cod.
8. Drift-net
9. Buoys
10. Herring.

6. It is also useful to note that more is demanded of the children than in the previous lesson. They are somewhat older, and the period is longer (one hour). They take a more constructive part in the development, and in the revision of the narrative, and their own written and map work is more sustained. They are also encouraged and expected to take part in other activities which do not appear in the lesson itself, but which arise from it indirectly. In the school where this lesson was given, children are encouraged to undertake "special individual studies" of their own, in their own time. A child may take a topic which interests him, and follow it up, using the lesson as a starting point, but going further and finding out as much as he can about it. He writes it up in his own fashion, illustrated by pictures which he gets from the illustrated journals and the teacher's considerable stock. These individual projects are preserved in folders, and to produce them in good style, well written and well set out is a matter of some pride and considerable rivalry for the children. "A Grimsby Trawler", "North Sea Fishing", "A Voyage to North Cape" and similar titles have been written up in this way, sure testimonies to the interest which work of this nature can arouse.

3. *Third Example*

China. To study small regions through close human contacts and from a number of them to build up the pattern of a larger region, is just as necessary for children in grammar schools. But for them this is only a beginning. They must look further to the causes and the relationships, and they should be able to study in a systematic manner the geographical factors which provide the setting.

In this example, the lesson is the first of a series on China in the third year of a grammar school. The opening lesson is deliberately designed to sketch the background on formal systematic lines—relief, drainage, climate, and against this background, detailed examination of the life of selected persons (Li, the peasant of the Great Plain, Wang, the oldest fisherman of Luhsien on the Yangtse, Fu-Chow, the farmer of the Red Basin, Tung Chi, a merchant of Canton), gives a more exact picture of smaller regions.

Within this general arrangement, the first lesson is planned as follows:

1. The teacher reads a passage from Bernard Llewellyn's *I Left My Roots in China*, (page 89):

> "The city of Luhsien stands on the north bank of the river and if you approach it from the south in a lorry, you make the crossing by ferry. This was a wooden flat, capable of taking two lorries at a time, poled along by eight men whose tapering, iron-tipped bamboo poles bent into arcs with the power of the current. When the vehicles had been driven aboard the ferry was poled alongside the little steam launch and made fast. And with a toot on its whistle the little steam ferry nosed into the flood. The Yangtse here was getting on for three times as wide as the Thames at London Bridge and the middle of the river was a deep oily green, moving relentlessly seawards two thousand miles away. There were constant eddies and whirlpools in that oily green as if the river god was stirring in his hunger, impatient for the next tiny sampan to overturn and deliver up its occupants to the swift waters.
>
> We would finally reach the landing stage. And it was by this landing stage that the city really began—the prosperous tree-lined city which is hemmed in between the Yangtse and the Lu River which flows into it from the north. Its main streets were of smooth stone over which the rickshaw coolies padded on bare feet, wiping their hot sweaty faces with dirty rags secured to their wrists.
>
> Sechwan is one of China's richest provinces and the shops have plenty to sell—a variety of silverware, silks, coloured cloths, tea, wines, pipes and fans. Some goods were made or grown locally; some came by junk upriver from Shanghai.
>
> Old wispily-bearded men with wrinkled faces sat in the tea shops puffing their long stemmed pipes, watching the scene with old, unseeing eyes as if they were remembering the far-off days when they and Confucius had been boys together."

The principal object of the passage is to create an atmosphere. The teacher soon makes the point that this picture is not necessarily typical of the whole country; that for convenience, there is a broad division into three regions: Northern and southern China, with the Yangtse valley as a central zone of transition between them; and that within these broad regions, there are smaller, more specialised regional entities, the Great Plain, the Loess, the Red Basin, areas of high land or flood plain, or the commercial scene of the great ports. In each of these, life has its own individuality.

This is illustrated with five very different illustrations. For example, these pictures:

Sampans in the Pearl River, Canton.
Planting rice in a paddy field, Kwang-tung.
Terraced fields in the Red Basin.
A street scene in Pekin.
The Yellow River, Shansi.

show some of the variety which China offers.

In this manner the teacher makes clear the purpose and stimulates an interest.

2. The pupils each have an atlas, a prepared outline map, writing materials and mapping materials. The blackboard has the same outline, with sufficient empty space at the side for a tabulated summary.

3. The pupils first put on to their own maps, at the teacher's direction, those facts which they can easily find for themselves, viz.: (Fig. 34.)

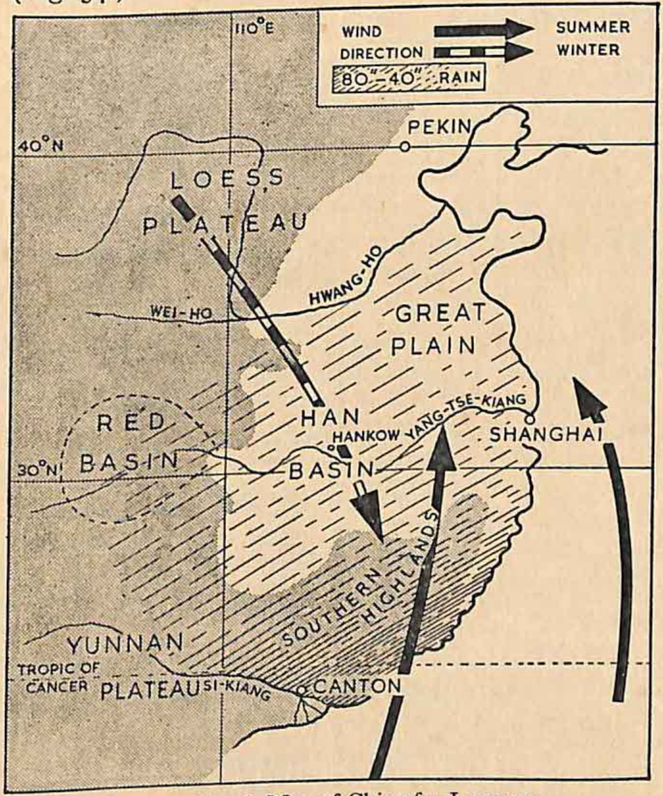


FIG. 34. Sketch Map of China for Lesson 3.

Position : Latitude 40 degrees N, 30 degrees N and the tropic of Cancer. Longitude 110 degrees E.

Relief : Land approximately over 1,200 ft.

Rivers : Hwang Ho ; Yangtse ; Si-Kiang.

Locations : Pekin, Canton, Hankow, Shanghai.

4. The class stop at this point ; in reply to the teacher's directions, children repeat these facts back to him from their own findings ; he puts these details on to his blank blackboard map, the children checking their own at the same time.

5. He elaborates these points further, going into some topographical detail of the Loess Plateau, the Great Plain, the Red Basin, the Han Basin, the Southern Highlands, recording these points in the first column of the tabulated summary (Fig. 35).

FIG. 35

Relief		*Climate*	*Notes*
NORTH	High in W. Loess Plateau Great Plain Shantung Pen.	*Pekin* W. 24° S. 80° Ra. 56° Rain 25″ Summer Monsoon.	*Rivers* : Hwang-Ho and Wei-Ho. Loess yellow and porous. Rivers and roads run in gorges. Fertile. *Irrigation* to grow wheat, beans, maize, cotton. *Silk* in Shantung Peninsula. Capital Pekin. Population dense in the plains.
CENTRAL	Red Basin Han Basin Coast Plain	*Hankow* W. 45° S. 90° Ra. 45° Rain 50″ Summer Monsoon and Slight Winter.	*Rivers* : Yangtse-Kiang. Fertile red soil in Red Basin of Sechwan. Terraced fields. Warmer than the North. Grows wheat, rice, tea, sugar, cotton. Dense population especially in river valley and plains. Port : Shanghai.
SOUTH	Southern Highlands Mts. run E.-W.	*Canton* W. 60° S. 80° Ra. 20° Rain 80″ Summer Monsoon and Some Winter.	*River* : Si-Kiang. Heavier rainfall, forested hills—camphor, bamboo. Rice, tea, sugar, oil-seeds. In high Plateau of Yunnan, cattle and sheep. Port : Canton. Many people live in sampans on river. Dense Popution.

These names are checked in the atlas, and both teacher and class keep their maps up to date as the description develops.

6. With this physical background complete, the class turns to climate. The children use the atlas maps showing seasonal winds and rainfall, and summer and winter temperature. It is asking rather too much for children of this age to interpret unaided the causes and the relationships of the significant facts which these maps of climate show.

On the other hand the teacher does not impart the information to a passive audience. He manipulates the situation so that together, the teacher questioning and suggesting, the class seeking and answering, they extract the facts from the atlas maps, and draw their conclusions. These findings are put upon the blackboard map, and in the second column of the summary, as in Fig. 35. For the present the children leave their own maps alone; their attention is fully taken up with their teacher in developing the theme.

7. When this is done, then they are free to return to their notebooks and record what they have found. They bring their own maps up-to-date, and their summary as far as the first two columns.

This is all there is time for in a lesson of one hour, but there is more to be done. The skeleton must be clothed. The children have had sufficient instruction now, and their next task is to work out for themselves a simple appreciation of each of the three regions, using the foundation which this lesson provided, together with those atlas maps which show economic and population distributions, and if they need it, an appropriate chapter in their text.

8. The most convenient way of doing this is to follow up the lesson with a homework period which requires them to fill in the empty third column of the tabulated summary. It takes another half-hour of working time to make notes similar to those in column 3 of Fig. 35, and it extends them just sufficiently to make them think. It is a compact, self-contained unit of work, arising directly from the lesson. Thus it fulfils the requirements of a short homework period very nicely. A task for homework should always be directly connected with schoolwork, either preparing for it, or arising from it. It should be definite and specific; it should never consist of finishing off an unfinished task which ought to have been done during the lesson, such as a half-made map or a half-written

essay. This makes for loose planning on the part of the teacher and it invites dilatory work from the children. It is very much better to take them so far in the lesson, finish the immediate task, and then to set another separate but related task for homework.

Subsequent lessons bring to life the character of the smaller regional entities—the Great Plain, the Loess, the Red Basin, the commercial cities. From this introductory lesson the children are equipped to seek further for the material to embellish these more detailed studies. Distributions will arise indirectly (rice, wheat, population) and they will map these and relate them to the physical and climatic facts which they have already learned. Profiles will be drawn for the climates of the chosen regions, using statistics which the teacher will supply; illustrations will be viewed in connection with these studies. They may read further in their own time from Mildred Cable, Bernard Llewellyn, Lin Yutang, Pearl Buck, or Hsaio Tung Foi.[1] The geographical society may show the film *People of China.*

4. *Fourth Example*

A Climate Profile. There are some skills in geography which have to be taught definitely and dogmatically. Such basic skills as sketch map drawing and construction of graphs for climate and rainfall are the tools which children will use frequently, and they should become habitual .

It is quite legitimate for the teacher to point out that there are exact rules to be learned and that there is no room for variations of personal style in graphic drawing, although there may be ample scope for it elsewhere.

This lesson is designed to teach the first year in the secondary school how to make a climate profile.

Although the teacher must give most specific and definite instructions in teaching this skill, this refers of course to the mechanics of actually making the graph. Even here, it is essential for the children to know what they are doing. The figures they use must be *real* statistics of climate, and never hypothetical figures made up for the purpose of giving a symmetrical result. Therefore, let the first graph be drawn at the end of a period long enough for them to have become familiar with the units of measurement through actually taking their own readings. There must always be a weather station at school, even if it consists solely of a bottle with a funnel in it and a thermometer hanging outside.[1] Meticulous accuracy and elaborate equipment are unnecessary for young children of this age. It may be necessary in the sixth form, but that is for a wholly different purpose. Here, the object is simply that the children should understand the idea of an inch of rain and degrees of temperature in terms of their own experience. For example, the total rainfall for the year at the school station will probably be somewhere in the neighbourhood of 20 inches ; in a month, there may be a couple of inches. An exceptionally heavy storm may bring an inch in twenty-four hours, as for example, when the diastrous floods at Lynmouth in 1952 came as the result of 1 inch of rain in the hills behind the village. Similarly with temperature. 40° F. is a cold day ; 60° F. is warm ; 80° F. is definitely hot. When children have some idea of these values, they are ready to record them so that one place can be compared with another.

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[1] See Appendix 2.

Monthly averages for a year relating to the school station provide the figures for the first graph. The graph is made on paper ruled $\frac{1}{4}$ inch square. A convenient size of paper to mount in the average school notebook, and at the same time to accommodate figures for twelve months is $5\frac{1}{2}$ inches × 9 inches. The instructions relating to the measurements for vertical and horizontal scales must be most definite and precise, viz. : " Place your paper this way up (vertically). Measure 1 inch from the bottom edge and 1 inch from the left hand edge. From this point rule a line horizontally across the page, and another vertically up the page.

" On the horizontal line tick off twelve squares. These represent the twelve months. Label them with the initial letters (J.F.M., etc. to D.).

" On the vertical line tick off five squares, and number them 1 to 5. Each of these represents 1 inch of rainfall. . . ." These instructions are accompanied by demonstration on the blackboard. On the base line and to this vertical scale the rainfall graph is constructed. None of the months will need a column higher than two or three squares,[2] but there is room for 5 inches of rain in any month if an exceptional case demands it. The $\frac{1}{4}$ inch square paper is admirably suited for a first graph, for the counting is done in single squares so no confusion can arise on that account. If $\frac{1}{10}$ inch graph paper is used at the beginning, the counting of so many small squares to represent so many inches of rain is a prevalent source of trouble. When the graph is made, the whole should be shaded lightly in blue, and vertical lines ruled to separate the columns. This is not done merely to make the graph look neater. It is a part of the proper psychological association, blue being used traditionally in geographical symbolism to represent water, and further, the children should learn from the beginning that rainfall is traditionally represented in geographical language by columns of varying heights, each standing on a base of the same width. Where these details are taught with meticulous care, children have learned right at the very beginning to draw their rainfall graphs correctly. After a few more such exercises, the habit is set, and thereafter they will always conform to these conventions.

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[1] Balchin and Richards describe the making of amateur equipment in *Practical and Experimental Geography*.

[2] Assume a school station in the Midlands.

The temperature graph should appear *above* the rainfall graph in the conventional fashion for climate profiles. In this case, the instruction is:

> " From the starting point, measure 3½ inches up vertical line and put a dot. From this dot draw a line horizontally across the page. This is the base line for the temperature graph. Divide it up into twelve months, as before. Again, from the dot measure vertically in *fives* (5, 10, 15, 20 and so on to 70) to each square. These represent 5° F. . . ."

The temperature figures are now graphed and the curve is drawn in red. There is room on this vertical scale for any figures which might arise for any station in this country. When the graph is drawn, the name of the station should be printed in; the maximum, minimum and range of temperature and the total rainfall are recorded at the side.

The next task, if not in the same lesson then at the earliest opportunity, is to make a second graph with statistics from another station in this country. It is here that the Schools Meteorological Scheme (1953) is so valuable. It publishes the *Schools Monthly Weather Report*, and supplies weather data for schools in this country as far apart as Arran and Jersey.[1] If statistics are graphed for Fort William and the two graphs are placed side by side the

[1] Editor: P. A. Jones, The Leiston Grammar School, Yoxford, East Suffolk.

marked differences in range of temperature and total annual rainfall will soon be noticed, *so long as the vertical scales remain the same.* This is the reason why precise instruction is so necessary. In this example the measurements have been worked out exactly so that there is ample room for the very high monthly rainfall of Fort William (10 inches approximately) to appear without changing the vertical scale. The teacher should draw very special attention to this point. Where children are not properly instructed in vertical scales, they are very prone to alter them at their own discretion. One has seen cases where with a temperature range from 40° to 60° F., they have extended the vertical scale to obtain a curve that "looks" well. But for another station with the range running from 0° to 80° F., the scale is compressed to produce precisely the same curve. The shape of the curves for continental and for temperate climates is roughly similar. The significant difference between them lies in the *steepness* of their curves, and this is only apparent when they are both drawn to the same vertical scale. It is to avoid errors of this kind later on in school life that very exact instruction is given at the beginning.

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The Bibliography for this chapter is given at the end of Chapter 6.

CHAPTER 6

THE USE OF ASSIGNMENTS

> Experience has taught the teacher that he cannot educate a crowd as a crowd, and that the success of his teaching depends upon the extent to which he can meet the needs of each particular pupil.
>
> DR. P. B. BALLARD

I IMAGINE there must be very few teachers who would not agree with the implications of Dr. Ballard's statement, even if they found it somewhat difficult to achieve. But the traditional method of teaching a class collectively is so firmly entrenched in educational practice that it is possible to find the aim being pursued by methods quite incompatible with it. Dr. Ballard describes, in his own engaging style, how a young teacher in the last century stumbled upon the truth by accident. Friday afternoons were largely occupied in making up the records for the week, and very much store was set in those days by the punctilious observance of attendance registers.

The last period on Fridays should have been spent in teaching geography, so in sheer self defence the teacher would fill the blackboard with instructions for enough work to keep the class quiet during this critical time. This was done with some misgiving for, like many other teachers of his day, the young man had a firm belief that he was not really " teaching " unless personally engaged in talking. He salved his conscience by putting forth the most herculean labours during the second period in the week when he taught another aspect of geography to the same class. When the time came to examine at the end of the school year, he was astonished to find that in the first topic which the children had studied for themselves to his written instructions, they were far and away better than in the subject on which he had lavished so much of his time and energy.[1] Not unnaturally he came to the conclusion that there is very much more to teaching than talking, and that children often learn better when they are given specific instructions for a particular task, and then left to get on with it at their own rate and in their own way. Since that time, these things have been established more exactly by careful enquiry and by observation of methods in the schools.

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[1] P. B. Ballard, *The Changing School*, Chapter XIII.

We might now consider in more detail why it is that independent working by individuals should show such notable educational advantages. And it is worth noting that this is not the only occasion when Dr. Ballard had so shrewdly observed fundamental truths in education long before they were generally acknowledged.

THE PRINCIPLES OF INDIVIDUAL WORK

1. *Individual Differences.* The fourth principle of learning in the previous chapter drew attention to the differences that exist between children of the same age. Individual *aptitudes* and *abilities* arise from their native intelligence, temperamental qualities, health, vitality; from their interests, and from home or other backgrounds which provide or restrict their opportunities. By ability I mean the quality of being able to perform a certain task, whereas aptitude implies a child's fitness for it, his readiness to learn it. Clearly one may have the aptitude for a given task and yet have no ability to perform it owing to lack of opportunity to practise it. So the aptitude remains latent, and the possessor may not even be aware of it. On the other hand, no amount of practice will produce competence unless the aptitude is there first. Opportunity is largely instrumental in pointing to interests which tend both to reveal aptitudes and consequently to develop abilities. A child who takes up an enterprise through having his interest aroused, and having tried it, discovers an aptitude for it, soon finds that his ability to perform it improves. For if the aptitude is there his initial practices tend to be successful. This breeds confidence and invites further practice, for success is encouraging. So does his interest remain alive and his ability matures. It is the school's function to discover where aptitudes lie by providing the opportunities which reveal them and to encourage those which appear to be most suitable for any individual child.

This is true not only of the subjects which a pupil pursues but also of the way in which he works. Children who are intelligent tend to work more quickly and in a more constructive fashion than those who are not. Although they are usually quick to see the point, they are not always the most profound thinkers, nor necessarily the steadiest workers. The dour, dogged individual may make up for a lack of intellect by perseverance to become just as competent as his more intelligent companion, but one who works in a wholly different manner. On the other hand, it is possibe to have intelligence and persistence combined in the same person. Some lack both. Further complications arise from the fact that some children may have what we are pleased to call a " general intelligence " of a low order, but possess one or two highly specialised talents in which they excel. Children vary also in their capacity for sustaining attention, and in their ability to memorise.

They differ temperamentally; some are dominant characters, thoroughly at home in the cut-and-thrust of a vigorous class room situation. Others who are more sensitive, shrink from it; either may show a marked aptitude for scholarship.

There is no end to the possible combinations of qualities in different pupils, and the result in practical terms must be that they tend to work best in different fashions. Some work quickly and steadily, other quickly but superficially; some slowly and tenaciously. Some are responsive to instruction, others show a preference for personal study on their own. Although a certain superficial uniformity can always be imposed in collective teaching, an attempt to reach a common level for the class will suit some but not all—" The amount of material introduced and the rate of progress will be too great for some pupils and too small for others; the result will be either frustration or boredom."[1]

2. *Incentive.* There are other incentives to work, apart from an interest in it. One of the most useful is the sense of achievement when a certain standard has been reached. In view of what has been said of individual differences it would appear that an *absolute* standard for everyone is inappropriate, for some will reach it easily and become sophisticated towards success, while others will never achieve it, and knowing this, they give up trying. The standard for any child ought to be the best that he can manage. Nor do the standards remain constant. As children progress, they should improve; consequently their best is always just ahead of them. They should be in the position of constantly trying to beat their own records.

If striving after an ultimate which recedes before them should seem rather too elusive for children, it resolves itself in practice to reaching a succession of clearly defined standards, each more

[1] A. Pinsent, *Principles of Teaching Method.*

searching than the last. This *incentive* to further effort is closely allied to the feeling of pride known by most children when they produce a piece of work which is undeniably their own. Those who react slowly to the demands of the routine lesson, discover fresh encouragement in a job which gives them the chance to create something original or to experience the thrill of discovering for themselves something which they did not know before.

Another incentive which children often find in individual work is the knowledge that they are " challenged " to do a task instead of being compelled. It is very gratifying to a child's self esteem to know that he is trusted to work on his own. He reacts favourably to the suggestion implied that he is under an obligation to produce so much work in a given space of time. It increases his confidence in his own powers, and this is a very positive aid to learning.

3. *Evaluation.* The older and more intelligent children find independent work attractive because it allows them to pause and to evaluate what they are doing. Work which is worth while for them not only has an element of personal achievement. It fits in with their developing notions of orderliness and progress, and is not only satisfying in itself but it leads on the young student to see the significance of his immediate work in terms of further and more remote fields which he has yet to explore. Intellectually this is the counterpart to the mechanical process of learning how to study. Study is not merely a matter of instruction in how to select and how to use the proper sources or how to set about an exercise. When pupils learn to appraise their work then they are developing an independence of mind in keeping with the purpose of their education.

For these reasons—in view of the wide differences between individuals, the many types of incentives which appeal to different natures, and the intellectual stimulus given to the more intelligent —flexibility in method should make it possible for children to work individually. Clearly some of them will rarely be able to dispense with the support of the teacher, but this only makes it more urgent for those who can to push on independently without being hindered by the slow progress of others. This tendency has been one of the most prominent features of education in recent years, but it does not do away with the necessity for class teaching.

G.T.G.

With personal knowledge of his class, a teacher knows what to expect of them, and he should be able to compromise by striking a nice balance between collective teaching and individual work as the occasion demands it.

METHODS OF INDIVIDUAL WORK

1. *Within normal teaching.* Very much can be done within the framework of normal routine lessons to encourage children to work alone. Exercises can be so arranged and their wording so framed that they have to complete by themselves a given task to the teacher's directions. This must be done gradually and at first with assistance. It is probable that the value of individual work is sometimes weakened when it is introduced too precipitately. Children who have long been accustomed to having everything done for them cannot be suddenly transformed overnight into students, and it is just as bad for them to founder from lack of direction as it is to be spoon-fed with dictated notes. Exercises must be so arranged that there is a progressive lessening of the teacher's support, and a corresponding increase in the pupil's own initiative,[1] and this can be worked in with the technique of ordinary teaching. Indeed, every time a teacher gives directions for work to be done by his class he is, in some measure, applying the principles of individual work. Many who would look askance at the word " Dalton ", apply the principles of that plan in their daily teaching without adopting its elaborate organisation.

2. *Essays, and other Independent Exercises.* Much of this work can be undertaken outside school time. Interests aroused in class lessons tend to carry over beyond them. Children can choose a topic arising from a lesson, which particularly appeals to them and write it up at their leisure. The teacher provides information about the sources and he may suggest the layout, but beyond that, the field is wide open for the child to make the best of it. I have seen many excellent examples of work done on these lines. Some of them were mentioned as " special " individual studies in connection with lesson 2 in chapter 5. These were virtually extended essays, written and illustrated by the children, and regarded as very special events, when only the best is good enough—a kind of *magnum opus* for the term, in which each child really shows what he can do. The challenge to produce the best is invariably taken

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[1] See, for example, the stages of written work on p. 128. of this chapter.

up, and some of these essays have revealed work of the first quality, showing evidence of enterprise in seeking the facts, well written, abundantly illustrated and presented in a neat and attractive fashion. The arrangements can vary. Some prefer to keep this in reserve until work of real quality can be expected. There is much to be said for establishing a tradition for these special studies throughout the school. Children in the first year produce a modest effort which may be little more than a scrap book of collected illustrations relevant to a topic, with a minimum of descriptive text. As the children go up the school, this changes year by year to work of a more intellectual character, until the sixth form write essays of considerable merit. Although the level of scholarship varies, the psychological principle is the same from the first year to the last.

3. *The Dalton Plan.* Individual work is carried to its logical conclusion in the plan adopted by Miss Helen Parkhurst and Mrs. W. Murray Crane at the Dalton High School, Massachusetts, U.S.A. So impressed were they by the soundness of the psychological principles which were its foundations (or rather, so unimpressed were they at the results achieved by collective teaching), that the organisation of the school was completely recast, and the teaching of classes as collective units was replaced by *assignments* of work which were drawn up for each subject, and for a limited period. The rooms ceased to be classrooms, and became subject rooms instead, in which the equipment and the texts necessary for the pursuit of the subject might be found. Armed with their assignments, the children then proceeded to whichever room was appropriate for the subject they wished to pursue, and worked at the assignment in that subject until a change of occupation was desired. So they might go from room to room at their discretion, arranging their time as they thought fit, the only requirement being that the basic assignment in each subject must be completed within the stipulated period. Once the required minimum had been reached, any time to spare within that period, might be spent on further study in a subject which the pupil found particularly interesting. The teacher and the pupil kept very careful records of the work done, each "unit" counting towards the minimum number which must be achieved in each subject. The authors of the system claim remarkable success for it, and students should read their original account.[1]

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[1] Helen Parkhurst, *The Dalton Plan.*

Even so, there are certain features of it which are unlikely to commend themselves to English practice, in particular the lack of personal contact between teacher and children, and the quite exceptional freedom of choice in regard to the arrangement of working time. This may sound very odd to English ears attuned to the ringing of school bells marking off the hours with unrelenting inflexibility. The plan in its complete form demonstrates that some times educational principles work best when they are *not* pushed to their logical conclusions. The principle upon which it is based—namely, that of individual work by the pupils—is a sound one, but there are other principles which tend to work in the opposite direction, such as the need to explain knowledge which is imperfectly understood, and the necessity in a full education for the impact of minds upon each other. Therefore it seems that the best part of this system, that is, the use of assignments, may well be employed in conjunction with routine teaching, without adopting the full organisation of the Dalton plan itself.

Some of the more obvious features of assignment work are these

1. The *aim* of the work is set out clearly for the pupil to see, before he begins. An assignment is constructed for a period of time—a month is often regarded as convenient—and for this period instructions are given for all the work to be done. Thus the pupil can see exactly where he stands and what is expected of him. He can see how the various tasks fit in with one another, and where his efforts lead; he can arrange his time accordingly. It is usually found convenient with younger children to divide the period into shorter sub-units, until they have acquired skill in budgeting their time.

2. The teacher makes the point that the children are regarded as *under contract* to complete the job in the required time. The cynic may say at once that this gives them a golden opportunity to do as little as they can get away with. In fact, this is not so. Most children have a crude but very strong sense of honour, and they welcome the exchange of compulsion for contract, quite apart from the fact that very many of them definitely prefer to work freely on their own, for the various reasons which were analysed at the beginning of this chapter. My own personal experience, and observations in other schools combine to convince me that working to assignments never produces *less* work than traditional

classroom method would cover in the same time. Very often children work faster, owing to the freedom from the necessity of keeping to a common rate. And those few who deliberately try to do less than the minimum are always those who would do precisely the same in ordinary class routine. In any event the teacher is still present. He can keep himself fully informed of progress without adopting the complex " unit " recording system so beloved by the Americans, and where necessary he can still bring the same pressures to bear upon the slack pupil as he would in any other lesson.

3. The *construction* of assignments needs to be very carefully done. If the essence of this type of work is a " challenge " to the pupils to find out, then the assignment must be " challenging " in tone, to set them on their mettle.

In this extract which follows, the work is introduced briskly : " . . . here is your job," . . . implying that there is work to do, and that it would be as well to get down to it :

SOUTH-EASTERN AUSTRALIA

For the study of this sheet, use :
- Atlas—pages 60, 61, 62.
- Text book—Chapter vi, pages 62-77.

Here is your job :

1. *First, a map.* Make very quickly, a general map of Southern Australia, which will include these States :

   South Australia.
   New South Wales.
   Victoria.

   Instructions :

   (i) On your outline map, put in the River DARLING, with its three main tributaries—WAREGO, CONDAMINE, MACQUARIE.
   (ii) The River MURRAY with its two main tributaries, the LACHLAN and the MURRUMBIDGEE.
   (iii) The boundaries of the three States ; name them.
   (iv) Shade lightly in brown, the mountains :
      1. Great Dividing Range.
      2. New England Range.
      3. Blue Mountains.
      4. Australian Alps.
      5. Flinders Range.

   Do not name them on the map, the names are too long ; instead, put the *number* of each range in the proper place.

(v) Lake EYRE, and the three main rivers running into it. Print—" 35 " near to Lake Eyre, to show that it is 35 feet below sea-level.

(vi) ADELAIDE, SYDNEY, CANBERRA, MELBOURNE, SPENCER'S GULF, ENCOUNTER BAY.

(vii) The railway from Adelaide to PERTH and ALICE SPRINGS.

(viii) Lat. 30 degrees S ; Long. 140 degrees E and 150 degrees E.

(ix) Title and key. In the key put in the names of the mountain ranges against the proper number.

The map is now finished.

The work is perfectly simple and straightforward, and it is done merely to locate the district in relation to Australia as a whole, and to make the children familiar with some of its main points. It is done on a complete outline of Australia on a scale of 1/40,000,000, the rest of the map being blank. (Each region has been located in this way against the background of the whole continent to serve as an introduction to it.) Since the map is merely introductory, children are not meant to spend much time upon it. Hence the instruction—" Make very quickly " . . . for there are other more urgent tasks waiting to be done. The sense of urgency is implicit, and this is stressed by the teacher.

Instructions must never be vague or ambiguous, but clear and precise, with exact references to page and chapters in the books and atlases, details of the maps to be drawn and of the exercises to be worked out. More detail will be needed for younger children and for those who are unfamiliar with working alone.

The following extract from an assignment illustrates notemaking by a class which still needs considerable assistance. They have not been familiar with analysing a text, nor indeed with extracting information from any source. Therefore the skeleton summary is given to them as a completion exercise, with most meticulous directions to page numbers showing where the information they seek may be found. Quite clearly they must be trained beyond this stage without delay if only for the reason that the teacher would be faced with an insuperable task in making out such detailed directions each time, quite apart from the greater educational benefit which follows from a measure of independence in written work.

Page references can soon be omitted, and as soon as they are able to extract information for themselves, variety in note making should be introduced, leaving more initiative with the pupils.

Example

"... We should now make a summary for Queensland and Northern Australia. In the notes which follow, words have been omitted. In the book you will find the information necessary to complete the gaps. The page numbers are given at the side. So with your book open at Chapter 7 and beginning at page 79, begin:"

QUEENSLAND AND NORTHERN AUSTRALIA

Page 79 "The Tropic of Capricorn passes through the middle of Queensland; it crosses the east coast at ——. Half Queensland is within the tropics. It has the same latitude as, and similar climate to ——, ——, and ——.

We divide Queensland into three regions:

(i) The Coastland.
(ii) The Highlands.
(iii) The Plains beyond the Highlands.

(i) *The Coastlands*

Page 80 Hot; summer rain; —— forest, growing ——, ——, and ——. Also, ——, and —— can be cultivated, but not fully developed because ————.

(ii) *The Highlands*

These are farther away from the coast than in New South Wales.

Page 82 The high slopes behind Brisbane are called —— ——; they are between 2,000 and 3,000 feet high, and therefore rather less hot than the coastland; —— can be grown here, but not any farther north. Summer rain and heat produce good pasture. —— are reared, but as one goes north, these give way to ——, reared for ——.

Minerals: Gold at ——; Coal near ——; Copper at ——.

(iii) *The Plains*

Page 83 These stretch northward from the mountains to ——, and southward as far as ——. They are dry, with rough pasture; 20 million —— are reared here. Since rain is scarce, —— is the chief difficulty. It is obtained from *artesian wells*. This water rarely is suitable for irrigating crops, but is satisfactory for animals; therefore —— and —— are reared in these dry plains with the help of artesian water.

Put in map page 83 showing artesian basins, and a cross-section. Now continue the summary. . . . etc.

Children who have become familiar with assignments can work quite competently with fewer directions. If a textbook happens to include exercises, there is no reason why some of these should not be selected for use, provided that they fit in with what the teacher wants, but it is not a good principle to become dependent on them, or the assignment loses its individual character:

Example:

WHEAT

For this study use your textbook at Chapter 1, pages 13-20 and in the atlas use maps showing distributions on page 20 and page 24; and maps of particular countries as you need them.

(i) Find and summarise conditions suitable for production:

(*a*) Climatic. (*b*) Physical.

(ii) Now enter on a world outline map the countries where these conditions hold. Shade them; put in their names.

(iii) Next, make climate graphs using the figures on page 14, for the following places which illustrate varieties of "wheat" climates:

(*a*) Winnipeg. (*b*) Cambridge. (*c*) Lahore. (*d*) Bahia Blanca.

Use the following scales:

Horizontal.—2 small squares to each month.

Vertical. —*Temperature*—1 small square to 10° F.

Rainfall—1 small square to 1 inch rain.

Start at the bottom of the paper, then you will get two diagram on each side. Put H for Harvest, and S for Seed time on each diagram at the appropriate month.

Look at Fig. 1, page 13, and see how the diagram for Winnipeg is described. Now write similar notes for each of the other diagrams, showing how they differ from one another if at all, and why they are suitable for wheat in spite of these differences.

(iv) *For North America*

Make suitable notes summarising in some detail, special mention of: (*a*) Physical and climatic limits to wheat area (*b*) Spring and winter sown areas (*c*) Modern methods of handling (*d*) Transport; comparison of alternative routes.

Note the sketch map on pages 16-17, Fig. 2. Make sketch maps on similar lines to illustrate the points in your notes.

(v) Using the statistics on Page 123 make two diagrams to show:
(*a*) World production of wheat by principal countries.
(*b*) Principal sources of wheat imports into Great Britain.

* * * * *

4. *Sources* should be used with restraint. Reference to too many only tends to confuse a child. A standard text and an atlas thorougly used, with illustrations provided in addition are usually quite sufficient. As children progress in this type of work, more references can be included and gradually they should acquire the habit of selecting, and comparing different maps and different books.

5. The amount of work included in any one assignment should be the basic minimum which the teacher requires from everyone, with the addition of extra work for the quicker and more able pupils. It is possible to arrange an assignment in two sections, thus:

Section A—the basic minimum required, to be completed first, and
Section B—more detailed work on the same topics, e.g. additional exercises, wider and more stimulating reading, very short projects relating to the same work, construction of maps, charts, or visual wall displays, etc., which may only be undertaken when Section *A* is complete. There can be infinite variety here, and it is often the more interesting part of the work; hence it constitutes an incentive to finish Section *A* without delay in order to tackle the more varied activities in Section *B*.

6. The teacher can help individuals, or groups, at the time when they are doing their work, and this is very much more profitable for them than correcting work after it has been done, and when the children are not present. A few words, the clarifying of an obscure point in the early stages of an exercise can often forestall errors which need not be made.

In this next example there is certain work for which some of the children may need help from the teacher:

Example

"... Now make climate diagrams for PERTH and COOLGARDIE to show: (*a*) rainfall and (*b*) temperature.

Use graph paper size 7 inches × 5 inches: use the following scale—
Horizontal—2 small squares to each month.
Vertical —(*a*) *rainfall*—one small square to 1 inch of rain.
(*b*) *temperature*—one small square to 10° F. of temperature from 30° to 100° F.

and put the temperature above the rainfall in each case. You will then get both diagrams on the same paper.

Here are the figures :

PERTH

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
Temp.	73	73	68	65	60	55	53	56	60	63	67	70
Rainfall	.5″	·5″	1″	2″	5″	7″	6″	5″	3″	2″	·5″	·2″

COOLGARDIE

Temp.	77	77	70	68	59	58	50	55	60	66	75	78
Rainfall	·5″	·7″	·5″	·3″	1″	1″	·9″	·7″	·5″	·3″	·2″	·3″

Now :

1. In each case, what is the
   - (*a*) Maximum temperature?
   - (*b*) Minimum temperature?
   - (*c*) Range of temperature?
   - (*d*) Total annual rainfall?
   - (*e*) Season of greatest, and of the least rainfall?

Therefore :

2. What difference do you notice between :
   Summer and winter in Perth?
   Summer and winter in Coolgardie?
   Perth on the coast and Coolgardie in the interior?

3. With chapter viii to help you, and the atlas maps on page 60 write a short description of these two climates, and point out the *reasons* for the differences between them. Illustrate this description with sketch maps which show the wind direction in summer and winter, and changes in rainfall as one goes inland from the coast.

Each of these three exercises asks for a little more intellectual effort than the one which precedes it. The first is simply a matter of reading the graphs which the children themselves have made. The second requires them to draw certain conclusions from the facts which they read. The third demands rather more interpretation and selective skill. Information from a written text, from maps, and from the climate graph has to be found and compared ; and the story, although a brief one, must be written up in logical order and in a reasonably lucid style. In this case the class has had practice in similar tasks, and ought to have no difficulty. The first two certainly present no obstacle, and the majority of the class manage the third. Some do not ; therefore this is one of those occasions when the teacher takes a group to one side and revises with them the seasonal migration of westerly winds, and the progressive decrease in rainfall from a coastline with an onshore wind, while the remainder of the class continue with their work without being held up for those who move more slowly.

Children trained in this method are more critical and self reliant, more skilful in planning their work, and certainly no less quick than those who have been taught on traditional lines. They are less affected by absence from school for on returning they continue where they left off.

7. *Collective teaching* to the class as a whole ought still to be taken from time to time to keep contact with the children, and to remove difficulties likely to be common to all; for example, obscurities in the subject matter; new methods of recording, like graph construction; new methods of interpretation, such as superimposing one distribution over another, or similar skills which obviously need to be taught. In class teaching, information which the children have already found for themselves can be elaborated to reveal significant detail which they might otherwise miss. One can revise after a number of consecutive periods, drawing the threads together, or test what the children have covered.

COMMENTS ON ASSIGNMENT WORK

There is a tendency, particularly among the less intelligent children to copy sections from the text quite uncritically, whether relevant to the immediate task or not. This fault is not peculiar to assignment work alone. They will do precisely the same when answering any exercise or when writing essays until

(i) they have been taught to write good English, and
(ii) they have been trained to be selective.

(i) Specialist teachers are sometimes inclined to ignore their responsibility towards English usage either on the ground that it is not within their province, or that it does not matter. Either view is educationally indefensible for one cannot look upon the English language as a thing apart. Whenever children write English, it should be done well. In geography we so often find it convenient to record information in graphic or in tabulated form, that written work tends to be overlooked. Serious attention ought to be given to note-making and to writing a balanced, coherent, account before children can be expected to work independently. I suggest the stages are these :

(*a*) Summaries or notes which are compiled by the teacher and children together, written up on the blackboard or dictated, and recorded by the children.

(*b*) Assisted completion-exercises. These are notes in which the structure is provided by the teacher but with words or phrases omitted. These have to be *sought* and found by the children to make the passage complete.

(*c*) Short written appraisals by the children, assisted by headings or words supplied by the teacher, the expression being their own.

(*d*) Written accounts by the children assisted only by blackboard notes arising from a lesson which supply the factual background.

(*e*) Analysis of information from sources (text, map, or other sources) in notes compiled by the children to written directions.

(*f*) Completely independent work in which the children choose the style most suitable for the occasion, whether tabulated summary, a descriptive passage, or notes in some other form.

(ii) With regard to the second point the remedy lies in correct teaching. Whatever the method ultimately adopted, children have to be taught the mechanics of it. It is quite wrong to imagine that they will be able to cope with an assignment straight away without assistance. At first the teacher should work through the instructions with the children until they get the " feel " of the method. Naturally some will acquire it more quickly than others. They may then continue while the remainder under tuition learn the art for themselves. When they have learned it, individual methods give them more chance to exercise it. There will always be some who will never have the intellectual stature to follow anything but the simplest instructions, but even these will profit in their limited way if the instructions are perfectly clear and the work adapted to their level.

Another tendency to which children are inclined, is to push through the work at top speed in order to press on to the next assignment, or to the second, and possibly the more attractive half of the same assignment. Speed is a virtue only when the work is properly done. There is no point in rushing through it in a superficial manner at the expense of scholarship or quality. Excessive speed is often the result in all good faith of an excess of zeal, a desire to be the first to finish, or to get ahead of the others. Restraint and more thorough habits are again a matter for good teaching, and if this is forthcoming it is a problem that solves itself.

A far more practical difficulty, and one that is less easily solved is the very severe demand made upon the teacher in setting assignments in the first place. A list of rather sterile instructions is not very inspiring. It takes time and much thought to construct assignments thoroughly.

It is probably true that a conscientious person prepares his lessons anyway, and that, assignments once made, will last from one year to another. It is also true that assignment work does lessen somewhat the strain of personal teaching; so it is possible that there is a certain amount of loss upon the roundabouts and gains on the swings in this matter.

If assignments are well made, they certainly take time to prepare; but this is offset by the very real gain in school, when individual children or small group can be dealt with at leisure.

The same arguments can apply with regard to marking of children's work and this is less easily overcome. In this method there is probably more work committed to paper than there would be in the same number of hours devoted to teaching. This must be so, for in the very nature of the method, many children are moving much faster than they otherwise would do. Further, it is most necessary to keep track of the work which the children are doing when they work independently. Lack of supervision is quickly followed by a deterioration in quality. Those who are inclined to slack, take the chance to shirk the issue; those who are keen, feel that they are not receiving the attention which is their due. There is no escape from the fact that assignment work must be properly checked if the system is to succeed, and although much of it is marked in class-time with the pupil present there remains a good deal to throw an added burden upon shoulders already carrying a heavy load.

4. *Projects.* There is no magic in the term project. It is simply an undertaking, usually a common undertaking in which more than

one takes part. Thus if one child alone writes up an account of a topic in which he is interested and illustrates it himself, it is an " individual study ". But if two or three collaborate to do the same piece of work, dividing it between them—one writing, another illustrating, and a third drawing maps, for example—then it becomes a communal effort and would be called a project. The organisation of projects can be varied to suit the circumstances. Small groups of children may combine to pursue topics which interest them, in their own time ; or a whole class may be divided into groups to pursue a common topic, each group taking a different aspect of it, and putting their contribution into the common pool. The final result is a far more extensive study than one child would manage by himself. In schools where flexibility is possible, there is no reason why geography should not be pursued in this way, in which case a series of related topics are studied during the year, by making each one of them a combined study in which all children have a specific aspect of it to work out.

From the educational point of view, a project has the advantage of providing a variety of tasks, suitable for all sorts and conditions of children. In this sense, although it is essentially a " communal " method, it has also the elements of " individual " methods. There are so many different things to be done, that everyone has a chance of finding something to his liking, and of tackling it in his own manner. There is reading and finding out, sifting and correlating results, writing up accounts, illustrations to be sought, arranged, and displayed, maps and diagrams to be drawn, visual displays or models to be constructed, arranging and editing, and organising work for different groups. Whether in an intellectual or in a humble fashion, each will be able to make his contribution somewhere here.

There is a certain sense of urgency about a common task which adds zest to the work. Children become very keen and work really hard to make their own part of it impressive when they know that it is going to be subject to the searching scrutiny of all their fellows. The chance to follow up a topic leads to really thorough investigation and often to quite original and scholarly research amongst the intelligent children. There is no lack of mental discipline for those who undertake the more academic aspects of a project.

If all the children are to benefit from this kind of work, it needs to be very skilfully handled. The principal dangers are these:

(i) Where children become absorbed in their own individual tasks, they do not always see what is being done elsewhere. They may become very well informed in their own small province but quite ignorant of the remainder. The results of the work as a whole must be made available for all those who take part in it.

(ii) If this method is used regularly, there is the possibility that the same children are employed each time for those parts which demand intellectual effort, because they do it well. This may be very good for them, but it is not so good for those others who ought to be occupied in a similar fashion but who never get the chance. It does not matter very much if those engaged in the humbler pursuits are really quite incapable of anything on a higher level. But it matters a great deal if children who are capable of intelligent work, are allowed either by lack of opportunity or lack of initiative to become complacent about spending their time in a manner which does not extend them. The organisation should arrange for the various duties to go round to different children.

(iii) Projects must be very expertly organised. The original purpose must be kept clearly in mind, and the subordinate tasks arranged with this aim in view. The fact that different children are doing different things at the same time demands much more skill from the teacher if they are to be kept constantly and purposefully occupied; and if they are not, they soon become bored. When this happens, the very freedom of movement inherent in project work invites disturbance and indiscipline.

This method illustrates so clearly, that the further one departs from traditional teaching, the more necessary it is to keep closely to sound psychological principles. If the teacher can do this and if he has considerable experience in handling children, then projects are safe in his hands. Younger teachers with less experience are well advised to move cautiously and to establish their position first, for an initial disappointment with a project can soon discredit in their eyes a very valuable method.

(iv) Novelty provides a good deal of the initial impetus for a project. When this wears thin, the interest is inclined to flag and the work then deteriorates. Change of occupation and change of method are always very desirable. It may be wise therefore to use projects with restraint, reserving them for those unusual occasions which provide a stimulus of their own—open days, exhibitions, special episodes of note which arise from routine teaching, and for those spontaneous interests which small groups of children are prepared to pursue in their own time.

BIBLIOGRAPHY

J. Fairgrieve, *Geography in School*, U.L.P., 1949.

Incorporated Association of Assistant Masters, *The Teaching of Geography*, Philip, 1952.

E.W.H. Briault and D.W. Shave, *Geography in Secondary Schools*, Geographical Association 1952.

Scottish Education Dept., *Geography in Secondary Schools*, H.M.S.O., 1951.

O. Garnett, *Fundamentals in School Geography*, Harrap, 1949.

J. M. Mogey, *The Study of Geography*, O.U.P., 1950.

H. C. Barnard, *Principles and Practice of Geography Teaching*, U.T.P., 1949.

J. H. Panton, *Modern Teaching Practice and Technique*, Longmans Green, 1945.

A. Pinsent, *Principles of Teaching Method*, Harrap, 1941.

A. G. Hughes and E. H. Hughes, *Learning and Teaching*, Longmans Green, 1949.

P. B. Ballard, *The Changing School*, U.L.P., 1925.

H. Parkhurst, *Education on the Dalton Plan*, Bell, 1922.

Board of Education, *Suggestions for Teachers*, H.M.S.O., 1947.

J. M. Armstrong, *Projects and Their Place in Education*, Pitman, 1950.

A. H. T. Glover, *New Teaching For a New Age*, Nelson, 1946.

H. C. Barnard, *Introduction to Teaching*, U.L.P., 1953.

C. W. Valentine., *Psychology and its Bearing on Education*, 1950.

ARTICLES IN *Geography*

D. Wilford, Group Work in Geography, Vol. 12, 1923.

M. Pearce, An Individual Method in the Teaching of Geography, Vol. 14, 1929.

T. W. Birch, Constructive and Creative Work in Geography, Vol. 28, 1943.

G. W. Sparrow, Geography with an 11 year old " C " Stream, Vol. 35, 1950.
R. J. Foster, Individual Projects in Grammar School Geography, Vol. 35, 1950.
C. Symonds, A Geography Assignment, Journal of Geography, 1950.

CHAPTER 7

INFORMAL METHODS

> I somehow got it into my head that nothing was knowledge unless it was, or could be, put into a book. I fell into the habit of attaching much more importance to the knowledge got out of books, than to the knowledge which came to me in other ways. L. P. JACKS

VERY many of us do this, teachers of geography no less than others. Not that we can afford to belittle the value of books ; not all of geography comes through the soles of the boots. Much of it is learned in systematic fashion by disciplined study, but the really vital spark is usually kindled elsewhere in the less formal episodes of daily life, after which the pupil turns (or returns) to his books to find out more about those things which have fired his imagination.

This chapter deals with some of those informal occasions outside the range of the textbooks, which can help to make geography a little more exciting.

1. TOPICAL EVENTS

Often there are times when it is possible to take from the press, headlines which could form the starting point for geographical studies. Here are some of them : " A Typhoon hits Eastern Australia," " Yangste, at 95 feet floods China's Rice Bowl," " Java volcano kills 25," " Cracks appear in the Lloyd Dam," " Disastrous Eruption in the Philippines," " Earthquake wrecks Aztec City," and just in case the student may get the impression that news items of geographical significance invariably deal in human disaster, we might also include " St. Lawrence Sea-way Project begins," " Fabulous oil wealth comes to Persian Gulf Sheikdoms," " Canada's vast venture in Aluminium " (the Alcan Project). The value of great events like the Royal Tour of the Commonwealth lies not so much in a visual record of the endless succession of State functions, but in the opportunity it gives to notice the geographical background of the stopping places on the route, many of them the lesser known places which might otherwise be missed.

It is my purpose here to explain the use that can be made of the more ordinary events which occur around us day by day.

A very special interest surrounds what the reporters would call " hot news ". The press will obviously emphasise the elements of drama and novelty, and these help to pin down the attention, but in school we must go further and see the event in its proper geographical setting. There are different ways of doing this :

(1) AS A BACKGROUND TO LESSONS

Because interest soon wanes or transfers to something else, topical news should be used while it is still fresh, and this is not always easy to do. One of the problems to be solved in the use of topical material is how to reconcile a logical systematic progress in the year's work with the very natural desire to make use of immediate interests. If suitable events occur when the syllabus can take them as a basis for lessons, so much the better. Much of the physical side of geographical work can be covered in this way, for it is not always necessary that these topics should be dealt with in the same order. Thus, if vulcanicity is to be taught, the eruptions in the Philippines in December, 1951, or in Java in January, 1954 give the teacher an excellent opportunity to make his lesson live. He will deal with the causes and the theories, lavas of different compositions, and the characteristic shapes that come from them. He will refer to major eruptions of the past (e.g. Krakatoa in 1883) and the customary cross-sections and maps of distributions which always appear on these occasions will be drawn. The interest will be all the greater by reason of the fact that the lesson has its origin in a living situation. If it is impossible for the lesson to coincide with the occurrence, reports of really notable events of this nature can be kept for use when they are needed without much loss of topicality. But in regional studies, only those events immediately available are useful for lesson illustration.

If for instance, one happens to be studying China, this press report with the headlines " Yangste at 95 feet Floods China's Rice Bowl ", is both topical and relevant—

> " There are strong indications that the floods now spreading over a great area of China's richest rice growing region may be the most disastrous in its history. Pekin radio stated today that the waters of

> the Yangste near Hankow, the chief commercial city in Central China, had risen to 95·8 feet, the highest level ever known there. About 6 per cent. of China's agricultural land had been flooded. Much of the rice crop had been destroyed creating a serious menace to production. Supplies for reinforcing the dykes were being sent to the area by all available means, including an air-drop. The battle against the swirling muddy waters was becoming crucial. New flood-crests, the result of the heaviest, most prolonged rainfall in China for 100 years, were rushing down the Yangste."[1]

and a reference to it would add point to the teaching at just the right moment ; it would be wrong to ignore it. But it would be quite irrelevant for a class occupied with some other region, and we cannot always justify time spent on following up extraneous matters however interesting or informative they may be.

Current accounts can make a starting point for a sample study. A class studying Canada might take as one of its samples, the far North, which has now come to enjoy an unusual public prominence for four reasons—the constant search for richer sources of new minerals related to industrial and armament production, the dispersal of industrial plants to more remote areas, the strategic importance of the region in view of modern developments in long-range aircraft, and the Aluminium Company of Canada's vast project at Kitimat, 400 miles north of Vancouver. The spotlight was turned upon this area by the visit of H.R.H. the Duke of Edinburgh, and extracts from the reports of his journeys make entertaining reading, and give a teacher the chance to enlarge upon an area which is little known but destined to grow in importance :

> "Three years ago, Kitimat, 400 miles North of Vancouver, British Columbia, was a remote Indian Village. It is now the centre of an aluminium smelting project which demands superlatives to describe it. When completed, six schemes spread over an area about half as large as Wales, will form the world's largest single integrated industrial development. Three K's—Kitimat, Kemano and Kenny, dominate this project. Kitimat, to be visited today by the Duke of Edinburgh, is where the smelter is, designed to produce 550,000 tons of aluminium a year. Kemano is the power centre. Kenny is the dam on the Nechako River, created at an elevation of 2,800 feet by impounding the waters of mountain lakes and reversing their flow from east to west. . . ."[2]

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[1] *Daily Telegraph*, 10th October, 1954. [2] ibid.

There is more describing this venture, with detail of rainfall, topography, industrial and hydro-electric development—and the fact that the alumina will come from bauxite mined in Jamaica 5,000 miles away.

Similar accounts describe his visits to the most remote settlements of Norther Canada—to Port Radium on the Great Bear Lake, now the Western World's second largest source of uranium, to Coppermine on the Arctic Coast, Yellow Knife, a gold mining centre on the Great Slave Lake, Churchill on Hudson Bay, and the Joint Services Research Centre for Arctic warfare, maintained by the Canadian, British and American Governments. They describe also the vast expanses of uninhabited tundra, the potential strategic, industrial and mineral development, the hazards of severe climate and the difficult communications which at present depend almost entirely on aircraft and radio.

From Yellowknife, the Duke broadcast over a network of amateur radio to isolated homesteads and small communities, giving his reason for his visit:

> " In the first place, like many other boys, I read stories about Canada's north-west, and I have long had an ambition to see what it looked like. The second reason is that three years ago, when the Queen and I were in Canada, we heard a great deal about new developments in this vast area. We heard of new mines and new discoveries and of growing communities. In the last few years I have had a chance to see a good bit of industry and I know from that of the increasing importance of base metals. So I decided to see where these metals come from. Nobody could think of any reason why I should not come and have a look—so here I am! "[1]

From accounts such as these, the children are likely to get a personal and intimate picture of this sample of Canada which is not found in the more factual language of the textbook. There is also a very good chance that the information is much more up-to-date in current accounts particularly in those areas where development moves quickly on novel and enterprising lines.

(II) FOR INCIDENTAL USE OUTSIDE LESSON-TIME

It is often more convenient to use topical matter outside lesson-time, in the form of a " current events board ", or a " wall-newspaper " on which topical matter is displayed. The children should be responsible for this in turn and they should be taught to do it really well. A few odd scraps of news cuttings pinned up in a perfunctory manner on to a soiled notice-board simply will not do. The principles of good visual display are given in Chapter 8, and these must be observed. It must also be made quite clear that educational benefit follows only when items are chosen wisely and arranged intelligently.

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[1] *Daily Telegraph*, 12th August, 1954.

This news-board should be put where it will attract most attention. A prominent position in one of the main thoroughfares of the school is a good place to have it, for then it is in full public view, and there is additional incentive to make a really good job of it If this is not possible, the geography room is the obvious place for it, near to the door where most children will see it as they go in and out. It is quite properly the geography teacher's responsibility to supervise this board, and if it becomes known that it is always worth looking at, it adds to the atmosphere and the standing of the geography room to be regarded as the natural centre for such matters. Fewer children might see it, but most of them use the room at some time in the week, and in any case they can always go and have a look.

Fig. 36 is an example of a simple but enterprising treatment of a news-item with useful geographical information in it. The topic

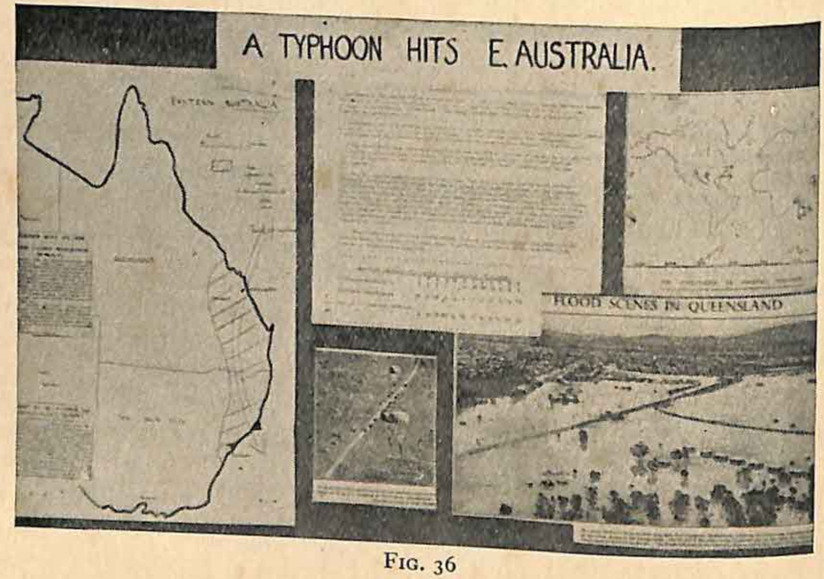

Fig. 36

is centred around a typhoon which devastated parts of Queensland during the weekend 19th-21st February, 1954. The display is mounted on a sheet of Cambridge paper 22 inches × 18 inches in size. It has a bold title; " A Typhoon hits Eastern Australia ". The main feature is an aerial photograph of a large flooded area near Rockhampton. A caption describes the severing of railway lines and isolation of settlements; another aerial photograph shows supplies being dropped by parachute at Springsure, Queensland. There are two brief press cuttings of one hundred words each under the headings " Fodder sent by air to Cattle marooned in New South Wales " (Richmond) and " Food to be flown to Queensland town " (Rockhampton).

A map of Eastern Australia shows Queensland and New South Wales, Sydney, Melbourne, and the names of all places mentioned in the press cuttings (Rockhampton, Springsure, Richmond). The track of the cyclone is shown and the area affected is shaded.

A small blank map of the world on a scale of 1/225,000,000 shows the areas frequently affected by tropical cyclones.

Finally, the teacher has added a very brief typewritten text of approximately two hundred words explaining the origin of such disturbances, and their frequent occurrence at the critical period of autumn. Wind velocities and characteristic rainfall (26 inches in 36 hours) are also mentioned.

In short, this example, though modest in scope is clear and informative, well planned and intelligently arranged. It is not exhaustive of its topic,—these displays are not intended to be—but it is sufficiently clear to give a great deal to the casual observer in a very short time and sufficiently stimulating to invite him to look further if he wishes to do so.

A display of topical events ought to be brief and to the point, as this one is. It is prepared quickly, remains in position for a very short while, and is replaced as soon as another occurs.

There is much to be said also for encouraging small groups of children to take an occasional topic of exceptional importance and to work it up as a project, seeking further for information and additional illustrations. This is a larger, more ambitious piece of work and it should be displayed with more care and planned in greater detail. There are two examples given in Chapter 8 on pages 199-204 where they are used to illustrate those principles of visual perception which ought to be observed when planning composite charts.

There are two other points related to this incidental use of current events.

The first is that it makes children familiar with the better press and gives them a chance to see the difference between objective reporting and sensational news-mongering. It is possible that some of them at least, will become more critical of what they read.

Secondly, much useful information is acquired informally in this way. Those who make the displays are brought into close contact with topics which they might otherwise overlook, and this is particularly true when a simple news item is developed into a project. Those not personally engaged in making the displays also learn much from casual observation. At those times when children foregather in groups, between lessons or during a break—a well arranged display attracts their attention, if only by the mere fact that it is *there*. Informal discussions and arguments arise at these times, the display serving as a focus for them. The very informality of the occasion allows the arguments to be expressed with some force; interests deepen and curiosity is quickened in this manner.

(III) TIME

I mention the teaching of time separately, because with the speed of modern travel it has become a matter of the first importance, and also because, more than any other branch of geography, it absolutely demands topical illustration. It can be very confusing to children, and abstract treatment makes it even more so, whereas incidents like the following are very much clearer:

(i) On 21st February, 1951, the (then) new Canberra Bomber left Aldergrove, Northern Ireland, at 12.30 p.m. for Gander, Newfoundland. The pilot had lunch before he left and arrived at Gander just after 12.30 p.m. local time, in time for another lunch.

(ii) When the M.C.C. tour Australia, it is customary to hear on the 8 o'clock news at breakfast time, the summary of play for the day which in England we are just about to begin.

(iii) Or conversely, when the Australians tour this country, the situation is reversed, and in the Test Match at Trent Bridge on the 13th June, 1953, the commentator was able to say: ". . . only a quarter of an hour to lunch; that is, a quarter of an hour to suppertime for our Australian listeners. . . ." And in the final Test Match on the 18th August (when fortunes were reversed also), the commentary at 5.25 p.m. (B.S.T.) runs: " . . . it is now in Australia 25 minutes past two . . . I wonder what their reaction is to this?" (as the Australian team collapses for 162); and later still when the match is over, " . . . Australians gathered round their sets far into the night as their countrymen's wickets toppled."

A teacher can make capital out of incidents like these. Why is it that the pilot of the Canberra has two lunches in the same day? How is it that we hear about the day's play when the day has scarcely begun? And if the Australians sit round their sets far into the night, is it by our time, the one before, or the one after the game? These things set the imagination running, and starting from here, there is far more chance of illuminating with globe and diagrams a situation in which the children can actually participate, than if they were invited to *imagine* what *might* happen in a hypothetical situation. There is reality in counting the hour lines round the globe in multiples of 15 degrees of longitude to establish the truth of the fact that Test Match time at Sydney is ten hours ahead of G.M.T., or that the time of the Empire Games at Vancouver is eight hours behind.

Fig. 37, is the result of a project which a group carried out on the flight of the Canberra. Naturally they were stirred by the incident and intrigued by the problem of time. The idea of the display arose during instruction with the globe. Editors were appointed to choose and arrange the illustrations. The map shows the route, and a small descriptive text is added, together with questions for the rest of the class to solve in these terms:

Summary

On the 21st February, 1951, the Canberra jet bomber flew from Aldergrove (Northern Ireland) to Gander (Newfoundland) in 4 hours 40 minutes. The aircraft took off at 12.43 G.M.T. and arrived at Gander at 1.53, Newfoundland time. The crew, who had lunch before taking off, were in time for another lunch on landing.

The aircraft was on its way to the U.S.A. where it was to be displayed before U.S. military chiefs.

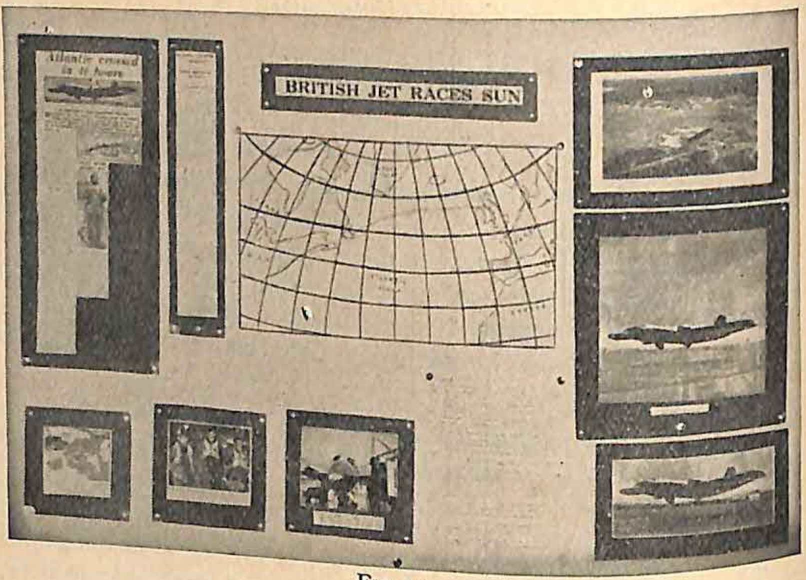

FIG. 37

Gander airfield is used as a refuelling point on most of the transatlantic flights. The normal civil air liners go from Prestwick to Gander, although some of the American Airlines use Keflavik, an airfield in Iceland, as a refuelling point.

QUESTIONS

Here are a few questions for you to think about:

1. How is it that the aircraft can leave at lunchtime and arrive in Newfoundland at lunchtime?
2. If the aircraft travelled a similar distance in an easterly direction in the same travelling time, about what time would it be locally at the point of landing?
3. From your answer to the first question, it would appear that if the aircraft had sufficient range, it could fly round the world in a westerly direction and be back at the same time as it started. Clearly it cannot do that. What is the explanation?

When they ponder the third question, the children come up against the problem of the International Date Line. Clearly, if the aircraft starts on Wednesday, 21st February, and if the pilot were to go on flying westwards at approximately 15 degrees in each hour, as the earth rotates, he would remain under the sun (i.e. at midday) all the time, so he would arrive back where he started at the same time, but obviously not on the same day. A whole day has elapsed, so he must add one on to his own time, making his time of arrival noon on Thursday, 22nd February. This must be demonstrated by means of an illuminated globe, with meridians marked upon it.

The example has its origin in an authentic case, but stretches into hypothesis which just lacks the ring of reality. It is better if this aspect of time can be rooted firmly in fact. There is a convenient case which will serve to illustrate the point, and it involves both eastward and westward travel. In 1950 President Truman visited General McArthur in the Pacific to discuss the Korean question. He flew to Honolulu (longitude 157 degrees west) in his aircraft the *Independence*, on Friday 13th October, 1950, and later went on to his meeting place at Wake Island (longitude 164 degrees east), crossing the International Date Line (180 degrees) on the way. The press carried the headline " The President's Two Sundays ", and so it turned out to be. His aircraft left Hawaii late on Friday night, and in crossing 180 degrees, he changed his time to Saturday night, arriving at Wake Island at dawn on Sunday. The conference with General McArthur lasted only a few hours, and the President left at midday returning eastwards, and changing back from Sunday to Saturday at 180 degrees, arriving eventually Hawaii on Saturday evening, to spend a second Sunday there. Merely to mention the press report is not enough. It is not easy for children to visualise why the day changes at the Date Line. The illuminated globe is quite essential in teaching this point. Then it is not quite so difficult to see that the meridian facing the lamp (the sun) enjoys midday on Saturday, while 90 degrees to the east and to the west of it people are passing through their evening, and their early morning respectively; and the meridian on the opposite side of the globe away from the lamp must be at midnight, *and* changing from one day to the next. Let them drive this in as often as necessary, counting the hour lines from longitude O degrees both eastwards and westwards until they meet at 180 degrees. Counting eastwards, they will say " one o'clock, two o'clock, three o'clock, in the afternoon . . . and so on to eleven o'clock on Saturday night, and finally at 180 degrees, . . . midnight Saturday/Sunday, i.e. Saturday has already gone. Counting westwards, they will say, " eleven o'clock, ten o'clock, nine o'clock in the morning . . . and so on to one a.m. on Saturday morning, and finally at 180 degrees, . . . midnight Friday/Saturday, i.e. Saturday has yet to come. So it is possible for two people to stand at Longitude 180 degrees, and differ by twenty-four hours in time according to which way they happen to be going. Obviously this will not do, so the convention has been established by agreement that the date is changed when crossing the line. After working this out from the globe, it is reduced to a rule of thumb, and the children can now memorise their rule which states "When crossing the Line *westwards*, omit a day (i.e. in this example, the President passes direct from one a.m. on Saturday to one a.m. on Sunday); and when crossing the Line *eastwards* repeat the same day twice". (i.e. in this example, the President is able to say, "Today is Sunday, and tomorrow is Sunday".) These things must have their origin in real journeys and actual people who can keep the time for us, and it helps if a model aircraft is used at the same time.

After all this has been done it is proper to make maps of the time zones, noting how the Standard Times established for convenience correspond to standard meridians, and how on occasions for local convenience, the line separating one zone from another may depart from the meridian. The children can also summarise what they have learnt by making a time calculator (Fig. 38). A circle is cut out of plywood, and a polar projection and meridians are drawn upon it at intervals of fifteen degrees. The circle is screwed through its centre like a wheel, to a baseboard. This board is marked with a twenty-four hour time scale on a slightly larger circumference. By turning the wheel, the standard meridian for any zone can be set to a given time, and local time at other places is then read from the scale.

2. Feature Films

Feature films in the commercial cinema contain information which reaches the children in popular language. There are far more opportunities to be found in films than one might at first believe. So frequently do we hear, and very rightly, of the less satisfying aspects of commercial cinema, that we sometimes overlook the fact that there are many excellent and moving films which have a geographical flavour also.

In such films as *Scott of the Antarctic*, and more recently, *The Conquest of Everest*, there are all the marks of high character and devotion to a single purpose. The power of their narrative is capable of suggesting to children a sense of participating in the expeditions, and of identifying themselves with the characters whom they see upon the screen. The spirit of adventure emanates from these films, and as Shackleton himself put it, the principal value of such achievements is not really scientific at all ; it lies in keeping the spirit of adventure alive and this is not entirely irrelevant to the study of geography.

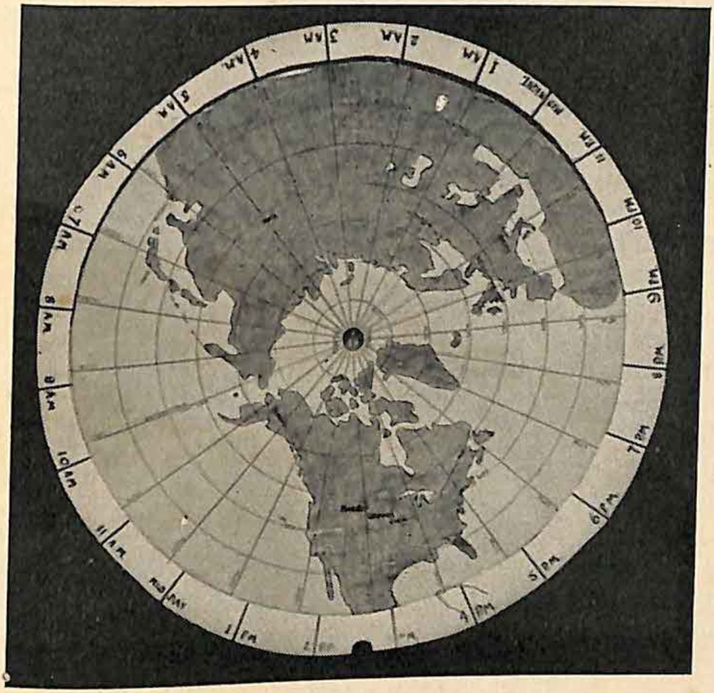

FIG. 38. A Time Calculator.

These films and others like them, notably *The Overlanders*, *Where no Vultures fly*, *Man of Aran* and *Bush Christmas*, bring alive the geography of the regions to which they relate and enrich the experience.

Teachers can make full use of them by directing the attention to items of special interest. They can point to the relationship between the film and parallel work in school, and supply sources of reading for those who wish to follow them up. They may also refer in passing to the aesthetic and to the inspirational qualities of these films, encouraging their children to see those which are of real worth and to appraise them intelligently.

Films do not always appear when they are wanted. 16 mm. versions of these and similar productions are admirable for viewing at the sessions of the geographical society. But the cost of hire is usually prohibitive. It is a most convenient arrangement to hire a full length film in parts, and to show these as a serial at successive meetings of the society.[1] This has the merit of spreading the cost over a period, and like all serials, of sustaining the interest from one session to another.

Good films encourage good reading. For *Scott of the Antarctic* the appropriate literature may be found amongst Shackleton's *South*, Mills' *Life of Sir Ernest Shackleton*, Elias' *Book of the South*, H. Ponting's *Great White South*, R. F. Scott's *Voyage of the Discovery*, E. R. Evans' *South with Scott*, Illingworth's *Men against the Arctic* and many others. The *Conquest of Everest* demands all the Himalayan literature by H. W. Tilman, Hugh Ruttledge, Frank Smythe, Eric Shipton, W. H. Murray, John Hunt and Maurice Herzog.

Children of all ages from 10 years upwards recently filled a waiting list for *Kon Tiki* at the library after the film had been shown.

This is education as it ought to be, a quest for knowledge arising directly out of a stimulating experience, which is all the better for a little judicious direction.

3. Reading from Fiction and Travel

At the beginning of this chapter, I suggested that we might discover sources for the young geographer other than books, meaning of course, the text books which are the standard fare in the schools.

Books of adventure for younger children and books of fiction and travel for the older, speak with eloquence of the spirit of a place, in a way which is difficult for the more conventional phrases of the textbook. They use a language which the children understand, and bring home yet again to them the fact that geography deals with living things. Authors have usually the authority of their own personal knowledge which is not always the case with those who write the textbooks. Even if they allow themselves a certain latitude in the interest of a vivid passage, we can excuse them a little licence in the light of their greater purpose, which is to inspire the student as well as to inform him. As a rule, literature of this kind appears in good English, and no less important, the individual styles reveal the personalities of the authors. Older pupils should be able to recognise these qualities in their choice of good reading.

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[1] This can be done in the case of some of the 16 mm. releases from the Gaumont British Film Library. Details are given in their catalogue.

Very young children find delight in books of adventure, particularly if they have animal or child heroes. *Jingoo of the Jungle* by J. Hughes is a favourite with them, so also are *Boomer, The Story of a Kangaroo* by D. Clark, *Eskimo Boy* by Pipaluk Freuchen, Pearl Buck's *The Chinese Children Next Door* and the *Young Travellers* series, published by Phoenix Press. Many of the old classics are still very popular in spite of certain archaisms of style—Rudyard Kipling's *Jungle Book*, R. M. Ballantyne, and R. L. Stevenson's *Treasure Island*. If they whet their appetite on these and others like them, there is no lack of suitable matter as they go up through the secondary school. By the time he is 16 years of age an intelligent boy is quite at home with adult literature. For China he can turn to Lin Yutang, H saio Tung Foi, Pearl Buck, Mildred Cable, N. F. Bradley or Bernard Llewellyn ; in Central Asia, to Heinrich Harrer, C. M. Patterson, Col. F. M. Bailey, Andre Guibaut, Ella Maillart and Peter Fleming ; in India, to J. and F. Kingdon-Ward and Francis Younghusband. The Middle East is described by St. John Philby, H. V. Morton, C. M. Doughty and Rosita Forbes. These are a few of the many writers whose work may enliven his more academic knowledge.

In this extract which follows, a scene of northern China is described with feeling :

> " Sometime after midnight, the train that was to take us as far as the Gap, pulled in and we got aboard. It had been cold waiting on the station. Even wearing thick clothes, I had felt it. As for the refugees, most of them had long since sold their winter clothing for food and I could see the skin through the rents in their thin tattered clothing. At another little crowded station, we piled our luggage on the open platform and prepared to sleep there, but rain came on out of the dark sky, steady relentless rain which looked as if it would last all night. We struggled after the wheelbarrow coolies looking for shelter, into the shadows beyond a few lonely lanterns. I am still

ashamed to remember how well I slept on the dry mud floor of an outhouse. Behind us in the open, men and women and children lay uncomplaining in the wet with almost no covering. They merely grunted and huddled even closer together as the rain set in, and a mother would clasp her baby a little tighter when it cried. I awoke at dawn, and it was still raining and the coolies who came to collect our luggage wore capes of palm fibre and wide waterproof hats. I looked out onto a grey dismal world. All you could see was the grey sky and falling rain. On all sides the wet yellow soil was lost in mist—a world of " loess " which the Chinese call " huang-tu " (yellow earth). For thousands of years, the winds had been building this land, covering it with layers of fine silt and forming it into cliffs hundreds of feet high, which had been turned into canyons by the rain. In dry weather the silt rises as dust from the wheels of carts and the feet of men ; in the rain it is an ocean of mud. We turned into a narrow cutting between loess walls, and the carts falling into the ruts that twisted ahead of them. I recalled the edict of the first Ch'in Dynasty Emperor, standardising the length of the axles of carts so that they could follow each other more easily over country like this. We jolted over ruts so deep that the axle bar scraped the earth, winding onwards until the loess walls about us dwindled and we reached the surface of the earth again. Then I saw, away to the left, a dirty streak of tarnished silver, and beyond it a bark blurred in mist. I was looking at China's Sorrow, the Yellow River."[1]

How much more revealing is this description than the standard text which tells us that China is a country of high mountains opening to lowlands along the Pacific coast ; that it has a monsoon climate with certain differences ; that southern China has a heavier rainfall than norther China, and that northern China has cold winters and hot summers. With Bernard Llewellyn, one can feel the cold and see the desolation ; one shrinks from the rain or slips in the mud ; there is a clear but melancholy picture of the wretched refugees, for generations an inseparable part of the Chinese pattern. Such a description reveals the character of the place and it is an impression that endures.

I do not wish to suggest that this should constitute the whole of a pupil's geographical knowledge, nor to make an unfavourable comparison between the graphic style of Bernard Llewellyn and the tone of the school text. Each has its purpose. The literature allows the pupil to capture that inner feeling for his region which otherwise eludes him.

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[1] Bernard Llewellyn, *I Left My Roots in China.*

It brings the place to life; it also contains just sufficient information to provoke further enquiry. For instance, here we learn that it is cold; that it rains; that loess is wind-borne and it is easily eroded; and certain human and economic interests are suggested. From these beginnings we wish to know more, for example, how cold? and how much rain? and what other facts are there which ought to be known for a proper understanding of the climate of this place? For each of these items of knowledge we have to turn to the text or to the atlas to satisfy our curiosity. We need to know more of loess, of the manner of its formation, and its fertility, and of the rivers which dissect its surface. We need to know very much more of these people, and the texts and the atlases supply the information. Wide reading in the literature and reference to the text support each other. The literature awakens interests, and stimulates a desire to know more. The texts supply the answers, and form the basis of more formal systematic learning. There is no necessity for these to be separate and distinct. It is quite possible for the same book to inspire and to inform at the same time, and this is very often found in those works which carry the weight of a distinguished authority or which are associated with particularly notable events. Some few of these are outstanding, in that they combine geographical information each with a unique quality of inspiration, in some cases it may be outstanding human achievement, or in others, adventure which captures a boy's imagination and appeals to his liking for the exotic.

Captain Joshua Slocum's *Sailing Alone around the World* opens a window on the world for boys who are stirred by adventure. At the end of a long life at sea, he built the *Spray* with his own hands and then proceeded to sail her round the world, taking three years to do it (1885-1888). As we might expect from such a man, it is packed full of robust incident and expert knowledge. He is richly informative on the winds and currents which take the *Spray* on her journey, often with her helm lashed for hundreds of miles at a stretch:

> "My ship was now running in the full swing of the trades and left me days on end to myself for rest. I employed the time in reading or writing or in whatever I found to do about the rigging and sails to keep them in order. On September 10th, the *Spray* passed the island of St. Antonio, the northwesternmost of the Cape Verdes, close aboard. The wind, north-east as the sloop drew by the island

was very squally but I reefed her sails snug and steered broad from the high and blustering St. Antonio. The sloop was now rapidly driving towards the Doldrums and the force of the trade-winds was lessening; I could see by the ripples that a counter-current had set in. . . ."[1]

A thrilling passage describes his battle with the barren solitude of Cape Horn in the teeth of "Magellan" weather, a mixture of relentless head-winds and "williwaws"—solid chunks of cold air which drop from the mountains to hit the water with the force of miniature tornadoes. When reaching for the Pacific at Cape Pillar, the *Spray* was caught in a westerly gale of incredible fury leaving no option but to turn and run before it, back through the Strait where she started from to begin all over again.

He writes in a warm and intimate style and his description of the Cocos-Keeling Islands is particularly beautiful.

This is the kind of book a boy cannot put aside. His son, Victor Slocum, has written a rather more sophisticated biography of his father which is also very agreeable reading, but lacking some of the invigorating personality of the old sailor.

A more recent book of the sea tells the same story of enterprise and adventure.[2] When Thor Heyerdahl launched his raft upon the Humboldt Current, his object was to prove the migration by sea in days long ago of Peruvian cultures to the scattered Archipelagos of the South Pacific. There may be substance in his theory, although his own voyage is not necessarily conclusive evidence of it. But whether right or wrong, his book tells a stirring story. He has much in common with Captain Slocum half a century before him. He builds his vessel from scratch. There are no balsa logs in Lima for his raft, so he goes up into the Andes, fells his own, and floats them down to the sea. He proves again the power of wind and current to take a craft on a predictable course with very little help from man. Creeping silently over the water on his tiny raft like a man stealing along a hedgerow, he moves among the teeming life of the ocean, seeing intimacies which would never be noticed from the deck of a steamship. All these things make as exciting a story as a boy could wish for, and there is much geography besides.

Books written about the world's great expeditions, are no less

[1] Capt. Joshua Slocum, *Sailing Alone round the World.*

[2] Thor Heyerdahl, *Kon-Tiki.*

enthralling today than when they were written; *The Ascent of Everest* by Sir John Hunt, revives for this generation a touch of romance in geographical exploration. It is fortunate that this achievement should be recorded in such a capable manner. Quite apart from the technicalities of the expedition, the author treats us to delightful geographical pictures as in this one, describing the approach to the mountain through Nepal:

> "Our track led us eastwards, thus cutting across the natural lines of drainage from the Himalayan watershed. We were moving athwart the grain of the land, down into deep valleys, across foaming torrents and broader swift flowing rivers and up the far hillsides. This was big country with long views across broad expanses of mountainside, vast, fertile and dotted with friendly cottages; the land had a warm, hospitable look. We found the people and their simple livelihoods a daily interest; the laborious hand-tilling of the soil along narrow strips of terrace carved into the hillsides; potatoes growing on ridges at 9,000 feet, hill reclamation work such as is being done in my own country on the Welsh border. It was odd to see hayricks planted in the branches of trees. As we passed from one district to the next, the nature of the dwellings changed—in one region were roofs with wooden slats weighted by boulders, as is done in many parts of the Alps, in other places we found them to be thatched or tiled with large flat stones."[1]

Later on, the story of the assault upon the mountain not only gives us glimpses into a world of great beauty, it shows also the grim determination of men striving to the limit of their endurance to fulfil their purpose:

> "And now began a struggle which none of us is likely to forget. If the wind had been strong on the Spur, it was terrible down here. My oxygen had finished before descending the Col, and Charles Evans took off his set to leave him more free to work. We were pathetically feeble, far too weak to compete against the fiendish gale. For over an hour we fought and strove with it, playing a diabolical tug-of-war trying to put up one single tent which can be put up in one or two minutes lower down. All the time the canvas was being snatched from our hands and we were caught in a tangle of guy ropes. Once I tripped over a boulder and lay on my face for five minutes or so before I could summon the strength to get up."[2]

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[1] John Hunt, *Ascent of Everest.*

[2] ibid.

From reading in this wider literature additional knowledge of the world is acquired, as well as some appreciation of the spirit which has sustained the explorers and the travellers to this day. In Appendix 2 there is a selection of titles suitable for children of various ages. There should always be a collection of such books on the shelves of the geography library, available for immediate reference or for casual reading when children have moments to spare.

4. THE SHIP ADOPTION SOCIETY

The British Ship Adoption Society developed from an experiment in 1934, when four merchant ships were each adopted by a different London school for the interchange of information between them. So successfully was this done, that in 1936, an organisation now known as the Society was established to extend the scheme for schools anywhere in the country. From the owners' point of view, the object is to make known to school-children the life of the Merchant Navy and so help to keep alive public interest in the sea. For the schools the aim is the same, with the additional advantage of securing geographical material at first hand. Now that the Society is an established institution, with a membership of roughly 1,000 ships and schools, not the least of the benefits enjoyed by both is the firm friendship that has sprung up between the children and the crews of their own ships.

Once adoption has been arranged by the Society, schools and ships correspond together. The schools keep track of their ships on the world map, noting its port of departure and destination and the ports visited during the voyage. They learn of the ship's organisation and routine, the duties of the various members of the crew, navigation, winds and ocean currents, the cargo carried on outward and return voyages and information about the ports of call and the countries to which they belong. The sailors very often send them illustrations and objects of local interest, otherwise unobtainable. All this material is kept in school in a special place, preferably as one of the displays in the geography room. In return the letters from the children make a welcome link with home when the crew are absent on long voyages. Parties inspect their ship when it is in port. Master and crew often return the visit to the school. It is a most happy arrangement for everyone, a practical method of extending the horizon to the very farthest limits and at the same time, giving new outlooks and new friendships. In industrial areas far away from the coast, these contacts blow through the school with a breath of sea-air.

The Society publishes a booklet which explains its procedure, and a regular bulletin entitled *Our Merchant Ships* containing current news of ships and schools, a most interesting account of voyages and other nautical news. As an example, the bulletin for March, 1953 contains a short history of the C.P.R. Fleet, a description by the master of the *Stanhope* of his voyage to Port Churchill in Hudson Bay, a description of the Medical Advice Service run by the Post Office for ships at sea, and the story of a six months' trip in the tanker *San Ubaldo* from the Tyne to Curacao. The Society also publishes a collection of extracts from typical correspondence from ships, edited by Leonard Brooks, entitled *Sea-farers and Cargoes.*

I have no doubt at all that this scheme imparts it own peculiar brand of zest to the teaching of geography in school. Unhappily, there are at present more applications from schools than there are ships to accommodate them, but where membership can be secured, the benefits that follow are of real educational worth.[1]

5. School Journeys

Journeys away from school are a logical extension of the local studies which are pursued around their immediate neighbourhood. They differ in that they apply only to the older children, and that as a rule, fewer participate if only on account of the cost involved. A geographical journey ought only to be undertaken for a very definite purpose, such as a survey which contrasts with the home region, or a study of some specific geographical topic; it is not simply a pleasant interlude. The work to be done must be planned beforehand and each group properly briefed. On returning to school, they should record the results of their labour. I emphasise again the necessity for a constructive programme of work in connection with these journeys. I am aware that the mere fact of going to fresh places is educative in itself and that the comradeship arising from living in company with one's fellows for a while is of social benefit. But much time, trouble and expense is involved and it is as well to get the maximum educational returns; and more important in my view, is the opportunity for training in disciplined geographical investigation which ought not to be missed. The administrative arrangements alone can be a formidable proposition. There are the questions of the teacher's responsibility, insurance, travelling, catering and billetting, to mention only a few of the problems with which he has to deal. It is often wise to seek the advice of a recognised body such as the School Journey Association which has considerable experience in these matters. This is even more necessary in the case of a journey abroad.

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[1] The address of the Society is—The Secretary, S. E. Britten, Esq., M.B.E., H.Q.S. " Wellington ", Victoria Embankment, London.

6. My Foreign Correspondent

Exchange of letters with children overseas frequently arises from school journeys. But in the absence of personal contacts, or to spread the net more widely, schools may belong to the scheme which is entitled " My Foreign Correspondent ".[1] Letters from experienced travellers are written in a personal style and circulated once every fortnight to schools which subscribe. There are many sets of these letters relating to different countries, and schools may select the set which may be most appropriate for them. To enhance the impression of personal association between reader and writer, the letters are typewritten. Description is colourful, illustrated with simple line drawings in the wide margins. A series is planned so that the successive letters convey the idea of following an itinerary, calling at a fresh place each fortnight. This helps to sustain the interest and to heighten the feeling of having a living contact with the outside world. It is an enterprising scheme. These letters are particularly useful for individual studies, although it is quite possible by purchasing a complete set to base collective teaching upon them, but this lessens somewhat the illusion of personal correspondence between traveller and children.

7. Observations

In the primary school, some of the first excursions into geography arise from local observations including those of the weather and sun.[2] Later on these same observations made in a rather more exact manner, constitute a large part of the geographical knowledge which comes from sources other than books.

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[1] Information from Messrs. Meiklejohn & Sons Ltd.,,15 Bedford St., London, W.C. 2.

[2] See Chapter 2.

(1) OBSERVATIONS OF THE WEATHER

A secondary school must have its own weather station. It need not be elaborate, for its purpose is not to obtain scientifically acceptable results, but only that readings may be taken and recorded in the conventional manner. Improvised instruments made by the teacher and class together, are really better for this purpose than professional instruments of greater accuracy, for the principles on which they are built are learned also. Moreover, children who have done this at school, very often make their own at home on similar lines and keep their own readings.

The simplest set of instruments consists of:

(i) A *thermometer* hanging in a place where it is shaded from the direct sun, and read every day at noon.

(ii) A *rainguage* made in the school, comprising any suitable container with a 5 inch funnel in it. A rather more robust construction can be made from an old drain-pipe standing on its broader end, with the funnel placed over the narrower end. A receptacle capable of holding about a couple of pints, is put inside the drainpipe with a length of glass tube leading into it from the funnel. The drain-pipe merely serves to protect the more fragile container inside it.

(iii) *Wind Vane.* Wind direction can be observed simply by noting the direction of smoke from a factory chimney. A school-made wind-vane in sheet metal can be made in the metal-work department. The balance between the weight of the tail and the weight of the arrow can be adjusted either by adding metal to the arrow head, or by lengthening its arm. At the point of balance the arm is rivetted through the spoke-holes of an old bicycle hub. The thread of the spindle is bolted through a hole in an iron angle bracket, and the whole instrument can then be mounted in a suitable place where it is open to the wind and free from artificially created eddies. The cardinal points of the compass are added by screwing horizontal rods to the fixed mounting.

These three simple instruments are quite adequate to give practice in keeping records.

Where older pupils undertake a serious study of climate, they should use instruments of design approved by the Meteorological

Office for they must learn to keep accurate records and to make objective comparisons.

In this case the school should possess a Stevenson screen which can be made in the woodwork department, containing maximum and minimum thermometers and wet and dry bulb hygrometers. There should be a grass thermometer also. The rainguage should be of the official pattern of the Meteorological Office, i.e. a glass receiver, standing inside a copper container and fed by a 5 inch funnel with bevelled rim, the top of the funnel being 1 foot from the ground. The correct tapered measure should be used with this instrument. The gauge should be set up on level ground, in an open space where rainfall is not affected by eddies or splashing. A flat roof although convenient, is rarely satisfactory as a site for the weather station, for this reason. An anemometer is a refinement which schools may not wish to meet. An improvised "apron" type can be constructed to work with the wind vane, which gives quite satisfactory readings.

(II) OBSERVATIONS OF THE SUN

Shadows cast from a vertical stick have already shown (Chapter 2) that the sun is high in the sky at certain times and low at others. The next question to be answered is how high or how low in angular measurement, and at what times. A simple home-made quadrant is a perfectly easy way of measuring the sun's altitude. It consists of a quarter of a circle cut in plywood mounted vertically on a board. A scale of angles is marked at the circumference from O degrees at the horizontal to 90 degrees at the vertical. There is a movable arm with two nails driven into it at a convenient distance apart, so that they cast a shadow when directed towards the sun (Fig. 39). The arm should be so adjusted that the shadows from both nails coincide; the angle is then read off the scale. This is repeated at hourly intervals. Graphs made from readings taken at the equinoxes and at the solstices show the variations in the angle of altitude and also that readings are taken over a much longer daily period in the summer than in the winter. Indeed, to get a full day's readings in June, someone will have to take the quadrant home with instructions to rise particularly early in the morning. In December on the other hand all the readings can be taken within the length of a school day, assuming that it is possible to see the sun at all. That the sun moves, or appears to move, is also noticed by looking again at the vertical stick from which we first measured the lengths of the shadows in Chapter 2. But this time we look at the horizontal angle between the shadow lines. By itself this tells nothing more than the fact that the sun apparently alters its position laterally as well as vertically. From this it is quite possible wrongly to infer that the stick stands still and the sun moves around it. It is asking a lot of a child to get him to imagine that it is his earth which does the moving while the sun remains fixed. In all these questions which concern earth movement, he must see the event taking place before he will really believe it. The only way to do this is to stand back and watch the earth moving in space and as this is clearly impossible, the next best thing is to reduce the whole proceeding in size, and to observe a model of it, i.e. a globe illuminated with a lamp. On this the children can work out the first principles of earth movement, by going through them for themselves. The shadow of a pin stuck into the globe at the school's position will move as the globe is rotated, to behave in the same fashion as the shadow of the vertical stick out of doors. Pins in other positions will reveal how the shadows behave elsewhere. The altitude of the sun above the horizon is seen to alter as the globe moves. All these things should be done at first hand with the globe placed in various posi-

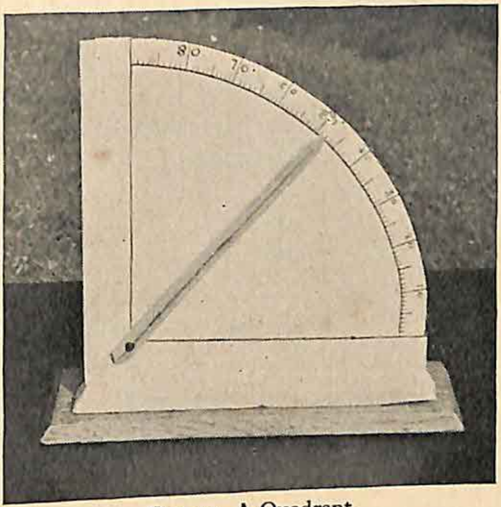

FIG. 39. A Quadrant.

tions in relation to the lamp to represent the situation at the equinoxes and the solstices. In all these experiments, the observations previously taken out of doors help to make clearer, and are themselves supported by, the events which are now seen to be taking place on the model globe. Armed with these first principles and a copy of Whitaker, there is no limit to the fascinating problems that can be worked out concerning such matters as the length of day and night, seasonal variation, the latitude of the school and similar mysteries; and as always, specific instances are so much more interesting to explore than those which are hypothetical. For example, Whitaker reveals that at the summer solstice the time of sunrise in latitude 52 degrees north is 3.40 a.m. and sunset 8.20 p.m.; whereas the corresponding figures for latitude 56 degrees north at 3.10 a.m. and 8.50 p.m. From the illuminated globe we can then work out why it is that Dundee should have roughly an hour more of daylight on June 22nd than we can enjoy in London. If work of this kind is to be really profitable children must be able to get near enough to the globe to see what is happening, to handle it, and to get round it. Most of them are too far away in class demonstrations. The apparatus must be set up on a table where it can be left for a while so that they can have the opportunity of handling it for themselves.

Conclusion

The general conclusion to be drawn from this chapter, is that children should be taught to seek for their information from their own personal observations, from daily events, from reading and from every source to bring their study of geography as close to reality as possible.

BIBLIOGRAPHY

WHITAKER'S ALMANAC

The Ship Adoption Society, *Ships, Seafarers, and Cargoes*, U.L.P., 1951.

My Foreign Correspondent, Meiklejohn.

The School Journey Association, *How to Promote a School Journey.*

The School Journey Association, *Types of School Journeys.*

The School Journey Association, *How to Promote a Continental School Journey.*

The School Journey Association, *The School Journey Record.*

P. A. Jones, The Leiston Grammar School, Yoxford, East Suffolk, *The Schools' Monthly Weather Report.*

E. T. Franklin, The Village College, Impington, Cambridge, *The Schools' Meteorological Scheme.*

W. G. Balchin and A. W. Richards, *Practical and Experimental Geography*, Methuen, 1952.

ARTICLES IN *Geography*

Geographical Association, School Journeys, Vol. 14, 1927.

Royal Meteorological Society, Suggestions for the Teaching of Weather Study, Vol. 16, 1931.

G. T. McKay, Simple Sun Paths, Vol. 16, 1931.

D. Peter, Climatology in the Teaching of Geography, Vol. 16, 1931.

A. H. Shorter, An Experiment in Using Accounts of Voyages of Cargo Ships in the Teaching of Geography, Vol. 21, 1936.

S. H. Beaver, Geography from the Railway Train, Vol. 21, 1936.

A. A. Miller, Microclimatology: A New Approach to the Study of Climate, Vol. 22, 1937.

J. H. G. Lebon, Notes on the Construction of Simple Meteorological Instruments, Vol. 24, 1939.

E. M. Coulthard, Experiments in Teaching Current Affairs, Vol. 27, 1942.

R. W. Waugh and D. H. Handover, How Aviation Changes Geography, Vol. 28, 1943.

A. A. Miller, The Geography of Current Affairs, Vol. 32, 1947.

J. H. G. Lebon, The Interpretation of Daily Weather Reports, Vol. 32, 1947.

R. Millward, The Place of Travel in Geography, Vol. 33, 1948.

W. G. Balchin, Local Climate Studies for Schools, Vol. 33, 1949.

J. Haddon, Newspapers in the Geography Class, Vol. 36, 1951.

H. C. Prudden, Classroom Work on the Daily Weather Report, Vol. 39, 1954.

P. A. Jones, Meteorology in Schools, Vol. 39, 1954.

SECTION IV

Illustration in Geography Teaching

CHAPTER 8

VISUAL ILLUSTRATION

If only we could see what we think about, we should think very differently about it.
G. B. SHAW

THIS is always true, and if anything it is likely to be a more significant truth in the teaching of geography than in any other context. Many teachers are skilled in describing unfamiliar scenes, and it is a matter of some pride to them that they can bring to life word pictures in the minds of their pupils. I have no doubt that capable teachers can do these things but I am sure that even if they can, they would be able to do so much more lucidly and to add point to their exposition, with the use of suitable visual illustration. It is important to understand the full meaning of this view. Illustration is regarded here as a useful device which may be used by teachers in addition to and in conjunction with their own personal teaching. A teacher's first job is to teach, and while so doing he may find it convenient to illustrate in order to clarify his teaching, or to make it rather more stimulating than it otherwise would be. In any event the process of illustrating is subordinate to the teaching. I wish to emphasise this, for nowadays we hear so much of the " new techniques " of " visual aids ". There are dangers in those terms.

In the first place there is little here that is new. Enterprising teachers have been illustrating their work for a very long time. The first illustrated English text dates from 1658 when the *Orbis Pictus* of Comenius appeared in this country. Sir John Adams set out the principles of good illustration in classroom practice in 1909[1] in terms which are as stimulating, and as relevant, today as when they were written for the principles were sound and these do not alter, even though the technical devices which we now employ are a little more complicated in character.

Secondly there is today a very marked preoccupation with the " aids " in preference to the teaching which they are supposed to enrich. The very natural result is that we now hear of "visual methods" as though there are some methods which are visual and others which are not; and this finds its ultimate expression in practice as *lessons* in which the teacher uses all his arts, and *visual aid lessons* in which he shows pictures. I wish to do what I can to dispel this notion and to condemn the practice which arises from it. I submit that only those teaching methods are permissible, which are based on sound principles. There are times when such methods permit, and indeed, demand illustration, and there are other times when they do not. It is therefore as an enrichment of any lesson needing it that illustration should be used. When this is properly understood we may get the emphasis in the right place, and perhaps we shall hear rather less of the "visual aids lesson"—an unfortunate term which ought never to have arisen and which has in my view done much to discredit the legitimate use of illustration in teaching. When it is realised that the teacher is always so very much more important than the apparatus he uses, perhaps also there may be a little less prejudice on the part of those who like to believe that they can teach just as well without it.

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[1] J. Adams, *Exposition and Illustration in Teaching.*

* * * * *

There are perfectly sound reasons for the use of illustrations.

(i) In the first place since visual imagery is strong in the majority of children, they will supply their own visual background in the absence of a more authentic one provided for them, and misconceptions are bound to arise. Even the simplest descriptions are liable to be misconstrued when the pronunciations are ambiguous or the phrases are unfamiliar. For example, a teacher giving his lesson on fishing in the North Sea has been known to say: "Drift nets are supported by a number of small *buoys* floating on the water." This teacher has at the back of his mind his own recollections of visual impressions formed from previous experience. These impressions are clear to him while he manipulates the words and phrases of his narrative, and they form the background for its unfolding pattern. But there is no such background for the pupils; for them the visual pattern is built up in the mind bit by bit as the story proceeds and the character of the final impression is thus dependent partly upon the imaginative powers, and partly upon the personal experience of each individual listener, and these will be very varied. This may be an interesting intellectual exercise and has much to commend it when the occasion warrants it, but the result can be very far from the truth, the whole point of a narrative may be missed and erroneous ideas built up through lack of common ground in the minds of the speaker and his audience.

This can be avoided by the simple expedient of providing by illustration a visual background to take the place of the more chancy, if more colourful, visual imagery of the children themselves.

(ii) Secondly, there is another reason why illustration in teaching is so valuable. From time to time I have stressed the importance of putting pupils into situations where they find out their facts for themselves, and having found them, interpret what they see. Passive acceptance of any information which we elect to impart will never help them to do this. But from an intelligent use of sources directed by the teacher and elaborated from his own wider knowledge there will emerge a valuable training in geographic discipline. A critical and thorough analysis of illustration in conjunction with other sources is but one method of keeping children actively engaged, and also, it may well serve to correct any bias in personal interpretation.

(iii) Thirdly, it is a commonplace of educational practice that in any lesson there must be variety—variety of stimulus, occupation, method. Verbal description alone does not provide it. Description backed by suitable illustration where appropriate has the merit that there are at least *two* forms of presentation, with the likelihood that they will support each other. If the one fails to convince there is the possibility that the other may have better success, or, what is more likely, the combination of both will prevail. Generally speaking visual perceptions are more powerful than aural and a combination of the two is more effective still.

There is simple but convincing evidence from one of Professor Valentine's experiments[1] which demonstrates quite clearly the superiority of an illustrated narrative over the verbal description unsupported by illustration.

* * * * *

METHODS OF ILLUSTRATING

Teachers have at their disposal a variety of illustrative devices varying from a blackboard and a piece of chalk to the modern sound projector. Skill in using all of them is a very necessary professional accomplishment. This does not mean skill in the technical sense, as for example, the ability to write a legible hand on the blackboard or proficiency as a projectionist. It means the ability to choose the best medium for any given occasion, and to incorporate it naturally within the structure of a lesson with that unobtrusive sense of timing which adds quality to personal teaching.

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[1] C. W. Valentine, *Introduction to Experimental Psychology*, Experiment No. 7.

These methods are summarised in Fig. 40. Let us examine them separately.

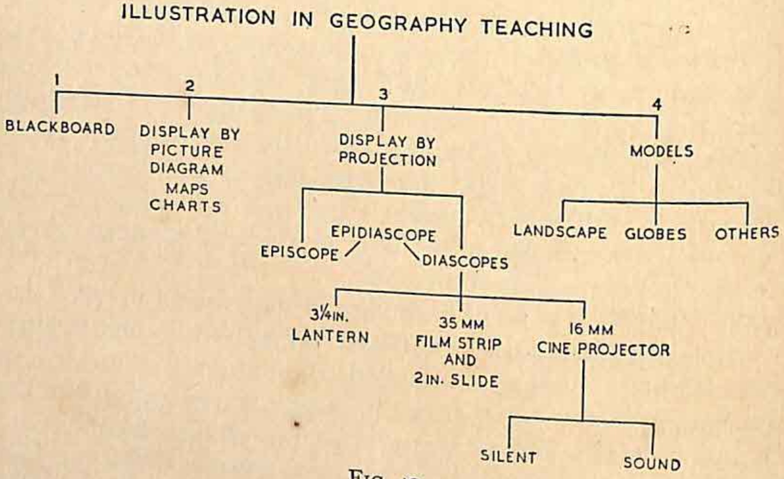

Fig. 40

1. The Blackboard[1]

The best illustration is the simplest. Yet there seems to be an impression that value depends upon the time and trouble spent in preparing it. I have seen most elaborate prepared work when a simple sketch upon the blackboard would have done equally well, better in fact, for it would have fitted more neatly into the natural pattern of the lesson.

During a recent summer conference on projection I saw an admirable example of the power of the blackboard. The room was equipped with all the latest projectors and screen units of every kind, hundreds of pounds worth of apparatus designed to provide illustrations. In the midst of it all, a lecturer was explaining to his audience the special features of a rather ingenious layout. At the crucial point in his exposition he took a piece of chalk, remarking, " Look, it goes like this . . . ," and turned instinctively (if we may use the term rather loosely) to where the blackboard would normally stand. There was no blackboard—the one thing which he needed *at that moment* to make his point clear. For lack of it the moment was lost and the force of the lecturer's point was very much reduced.

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[1] *Ministry of Education Building Bulletin No.* 9 prefers the term "chalk Board" for the very good reason that so many boards are no longer black.

A blackboard is intended for immediate use. As a lesson unfolds, the quick sketch or sketch map, a brief summary, the writing up of new or unfamiliar words ; a few deft strokes (as in Fig. 41)

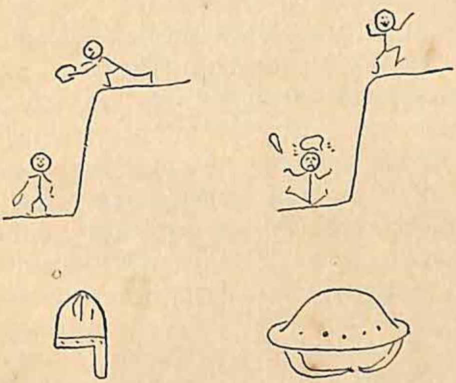

FIG. 41. Simple Blackboard Sketch.

sketched at the right moment will drive home a point which cries out for simple and effective visual emphasis. It is not the artistic skill of the teacher which is important here ; it is his sense of timing—developing his sketch before the eyes of the class, the pupils participating in response to his questions and so providing much of the information which goes upon it. It is important that the teacher maintains contact with the class while developing his blackboard work. This he can do with chalk in hand, turning from the class to sketch in a feature or write a phrase, holding their attention meanwhile with a comment or a stimulating question, turning back again to take the development a little further ; this vigorous give and take, briskly illustrated, adds zest to teaching which is demonstrated exceptionally well in the Ministry of Information Film, *Your Children's Eyes*. The blackboard sequence in this film is a model of brilliant blackboard teaching, and I suggest that students who may see this film, should look out for this technique.

Students who are apprehensive about their own skill, or the fear of losing contact must nevertheless make use of every opportunity for it is only by practice that sufficient skill comes to give confidence. Quick sketches with bold strokes are better than elaborate drawings with meticulous detail. Writing is frequently too large at first, with thin spidery letters, and sloping lines. The size of letters given on page 202 for wall charts can be taken as a suitable guide. Lines of different thickness can be obtained by varying the pressure on the chalk. Writing tends to slope downhill when the teacher remains rooted to the spot, stretching to reach inaccessible parts of the board. These things can be mastered with practice remembering always to choose the psychological moment for the blackboard sketch so that attention is fixed to see what is going to happen next, directing attention to the developing sequence, throwing out leading questions, keeping the class moving and avoiding at all costs the long embarrassing pause, the pregnant silence, while the teacher is busy at the board and the class behind his back is left at a loose end. It is as well also to avoid obscuring the board, and to dispense with notes or text book while writing.

MAP OUTLINES

I have already mentioned that in sketches the line should be firm, bold and quickly executed. The same applies to the outline of maps. Meticulous accuracy in coastlines is not required. Generally speaking the more detail put into indentations, constantly rubbing out and filling in again in search of an elusive accuracy, the less is the likelihood that the general proportions of the map will be correct. Examples of simplified, diagrammatic map outlines are given in Fig. 19 in Chapter 4. It is a great help as well as good geographical practice to put in beforehand a guiding line or two, parallels and meridians which serve as a simple graticule to preserve the general shape and proper spatial relationship between one part of the map and another. Some teachers like to project an outline on to the board from a slide[1] held in the strip projector; this line can be chalked over and when the projector is removed a perfect outline is the result but it is rather a laborious business and I am inclined to favour the sketch which is free, spontaneous and very much more natural.

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[1] The *Map Quiz* Series of filmstrips by British Instructional Films Ltd., is suitable for this purpose.

COLOUR

Colour should be used judiciously to emphasise particular features and if the colours have significance as in the case of distributions, a key should be provided. The choice of colour is important; it is well to avoid the non-luminous colours—purple particularly—which are very difficult to see against a black surface from a distance. Contrasting colours make the map or the diagram easier to interpret. Maps soon become overloaded with detail. This is so in any map; it is more so in the case of blackboard sketch maps where the symbols or the printing have to be read from a distance. To avoid this, significant matter can be put into a frame at the side of the map, with an arrow pointing to the appropriate place. Writing can be much larger in this case, and the map is easier to read. Names may be abbreviated, and in the case of towns initial letters only may be used, the class interpreting them from their atlases. In the case of unfamiliar place names the full name should be written sufficiently large elsewhere on the board.

Although the most profitable blackboard work is done as direct llustration while the lesson proceeds there are occasions when an original map or a written summary must appear on the board *in toto* before the lesson begins, or remain for further use, possibly with a parallel class. Such occasions should be rare, and if it is a common practice to find blackboard work marked with the legend: " Wanted. Do not rub off," it is a fairly sure indication that the space is not being used to the best advantage, and that the matter so labelled ought to be displayed in some other form—by means of a wall chart for example.

ARRANGEMENT

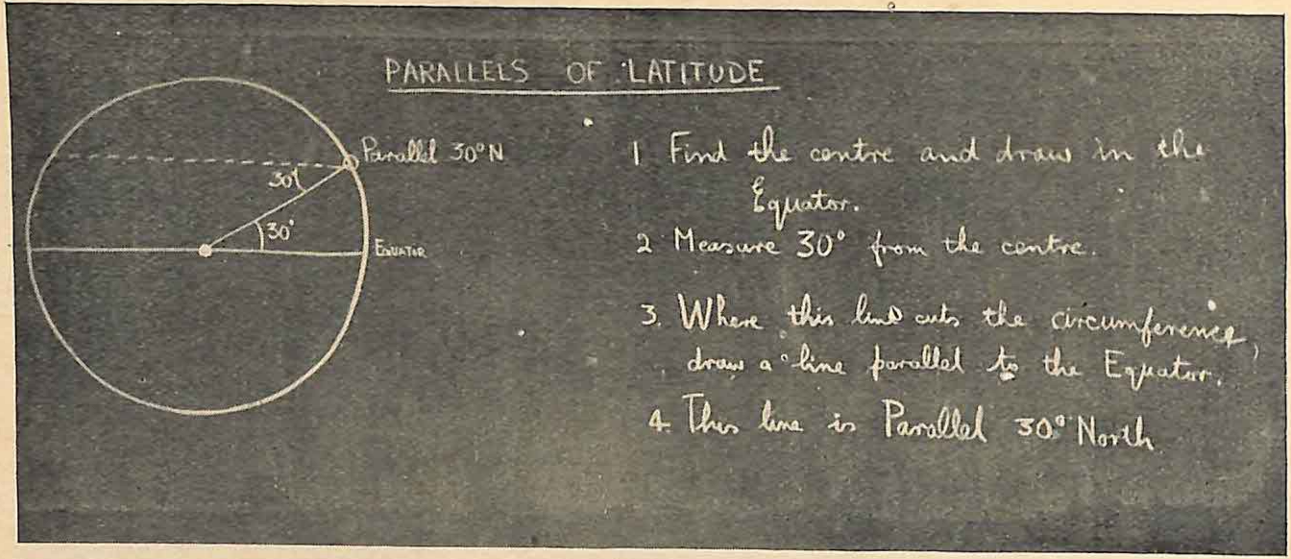
The arrangement of the blackboard should be planned as thoroughly as any other department of a lesson. It is not uncommon to find a blackboard covered with the residuum of many previous lessons. In any vacant space a teacher may write up odd words as they occur during his exposition, an unsystematic and untidy practice which inevitably leads to untidy work in the children's notebooks, for there is little doubt that they will accept and emulate standards which the teacher sets for them.

At the beginning of the lesson the board should be cleaned off completely and the available space planned accordingly. In Fig. 42 a simple diagram explaining angular measurement at the centre of the globe is drawn well to the left large enough to be clear, and the brief summary of events built up as the explanation is developed and as the diagram is completed. The sequence of events is—a clean board, a plain circle drawn free-hand without compasses—it is not a perfect circle but it is accurate enough for its purpose; the details filled in free-hand, without the use of instruments; the summary built up alongside point by point.

In Fig. 43 the lay-out needs rather more careful planning. As before the board is clear at the beginning. The object is to teach the physical development of the Netherlands showing the contributions of glacial, fluvial, marine and wind action. At the beginning of the lesson the title is written in block capitals and underlined and the brief statement " The Netherlands is the result of glacial, fluvial, aeolian and marine action " written below it to serve as a focus for attention and to stimulate ideas. When the explanation of the adjectives has been disposed of, the exposition proceeds illustrated by the map, built up step by step in this order: first the outline firm and bold and simple, sketched rapidly in one sweeping movement, and this is very much easier than it looks. The outline is placed well in the middle of the board to allow room for the three main movements, each indicated by distinctive arrows and each with its brief explanatory legend appropriately placed. The headings are in BLOCK CAPITALS and underlined so that they stand out, and after the brief statement the RESULT is briefly given as for example:

GLACIAL ACTION
Sands and gravels brought
down by swollen ice-age rivers.
RESULT—Light Soils.

AEOLIAN AND MARINE ACTION
Winds and sea
currents have thrown
up sand dunes.
RESULT—Dunelands.



PARALLELS OF LATITUDE

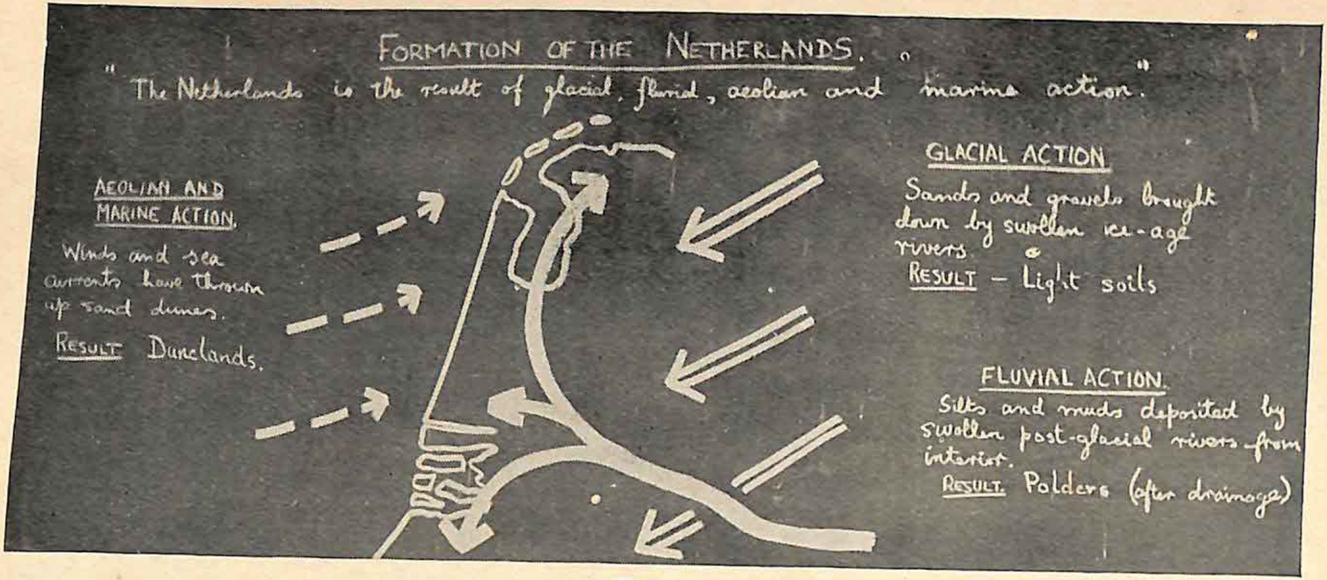
1 Find the centre and draw in the Equator.

2 Measure 30° from the centre.

3. Where this line cuts the circumference draw a line parallel to the Equator.

4. This line is Parallel 30° North

FIG. 42



FORMATION OF THE NETHERLANDS.

"The Netherlands is the result of glacial, fluvial, aeolian and marine action."

AEOLIAN AND MARINE ACTION.

Winds and sea currents have thrown up sand dunes.

RESULT Dunelands.

GLACIAL ACTION

Sands and gravels brought down by swollen ice-age rivers.

RESULT – Light soils

FLUVIAL ACTION.

Silts and muds deposited by swollen post-glacial rivers from interior.

RESULT. Polders (after drainage)

FIG. 43

FLUVIAL ACTION

Silts and muds deposited by
swollen post-glacial rivers
from interior.
Result—Polders (after drainage).

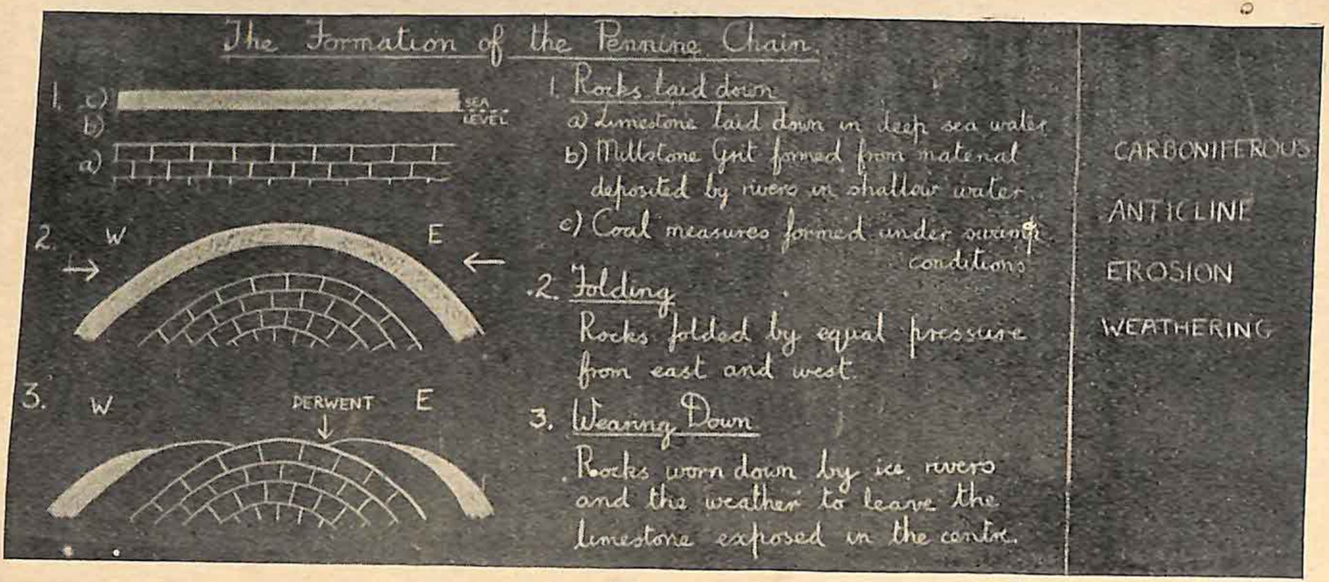
The arrows are firm and bold, drawn with the side of the chalk broken into small pieces. Actually during this lesson distinctive colours were used but these have been replaced by arrows in their present form to reproduce more effectively in photography.

The whole makes a brief but lucid summary which sets out the salient features quite clearly and which forms a neat record for the children's notebooks.

Fig. 44 shows a somewhat different arrangement. The blackboard is spaced out in thirds. We need room for developing diagrams, for a brief statement of events, and in this case, for new and unfamiliar words which are likely to occur. It is convenient to keep these together and a column is ruled at the right-hand side for them, leaving the rest of the board clear.

The title is written at the top and underlined. Exposition is illustrated with diagrams at the left and the summary of principal points as they occur in the centre, with each brief paragraph alongside its appropriate diagram. White chalk only was used in this case. The formations in diagram (i) were represented by distinctive shading and summarised in the note alongside. In diagram (ii) the effect of even pressure from east and west is shown, the illustration being elaborated in this case by the children compressing into an anticline a piece of loose paper lying flat on their desk lids. In diagram (iii) the same anticline is "denuded" by the blackboard rubber and the effect is compared with a reference to atlas map and text book. There it is seen that the carboniferous limestone and the millstone grit do occur in the centre of the Pennines and the coalmeasures appear on the flanks.

The same planning is characteristic of the lesson of which Fig. 45 is a summary. The object in this case was a description of the features of the millstone grit country, with particular emphasis on the curious rock shapes produced by differential weathering, and on the characteristic "edges" found in this type of country. These appear on the map in a running-together of the contours, and in the landscape as precipitous cliffs. In order to focus the attention on a characteristic section of landscape a small



The Formation of the Pennine Chain.

1. Rocks laid down

a) Limestone laid down in deep sea water

b) Millstone Grit formed from material deposited by rivers in shallow water.

c) Coal measures formed under swampy conditions

2. Folding

Rocks folded by equal pressure from east and west.

3. Wearing Down

Rocks worn down by ice, rivers and the weather to leave the limestone exposed in the centre.

CARBONIFEROUS

ANTICLINE

EROSION

WEATHERING

FIG. 44

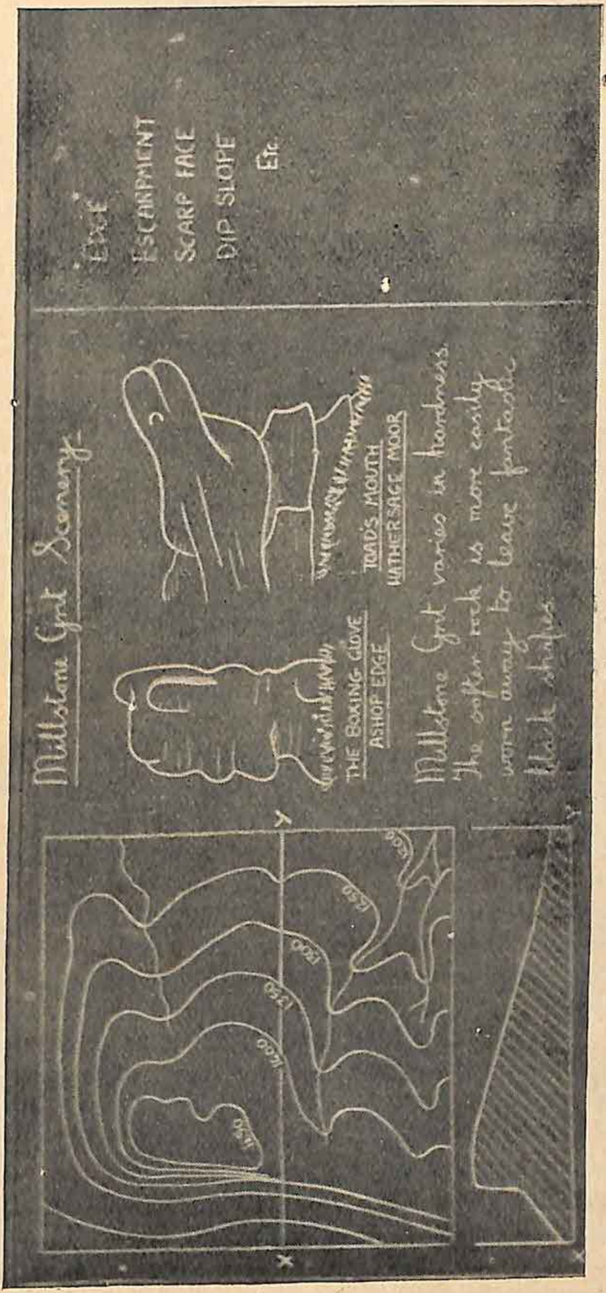

X
Y
1450
1400
1350
1300
1250
1200
Millstone Grit Scenery
THE BOXING GLOVE
ASHOP EDGE
TOAD'S MOUTH
HATHERSAGE MOOR
Millstone Grit varies in hardness.
The softer rock is more easily
worn away to leave fantastic
rock shapes
EDGE
ESCARPMENT
SCARP FACE
DIP SLOPE
Etc.

FIG. 45

portion of the 1 inch sheet was drawn out on the board as prepared work before the lesson began, well to the left of the board with space below for a section. A right-hand column was ruled off for new and unfamiliar words and for incidental illustration, the space in the centre being left free for development. Thus the board at the beginning of the lesson was clear with the exception of the title and the contoured map at the left-hand side. The exposition then began, first locating the area on the 1 inch sheet which each child had before him, and the general features of the landscape were described. Attention was then switched to the enlarged portion on the blackboard and detailed analysis of its features followed ; line *XY* was drawn in and the section below the map was built up after several trial sections in the centre of the board which is, as yet, unused. Next the differing textures of the rock were described with specimens produced in the classroom ; the effect of weathering was illustrated by the rapid line sketches which were done with a few strokes in a moment and the precise locations of these examples were found upon the 1 inch sheet. A brief note is added beneath the sketches.

Apart from the arrangement and planning of the board, an additional feature in this case was the use of colour. The contour lines were drawn in a pale orange with rivers in blue. The line *XY* on the map in red, stands out in contrast and the same colour was used for *XY* at the base of the section emphasising the fact that the two go together. All other blackboard work was done in white chalk with the exception of a touch of green at the base of the rock sketches.

The principal features to notice from this example are the combination of prepared work and incidental work ; and from the lesson which goes with it, the combined use of various kinds of illustration which support one another. There are individual copies of 1 inch sheets for the area on the desks, and the enlargement of a portion from it on the blackboard. There are the incidental sketches and other blackboard illustrations, and the specimens of millstone grit ; and finally a wall display of illustrations too small for collective use.

I have mentioned earlier that appropriate illustration should fit into the lesson as it is required ; here is an example of how the various forms of it occur at the proper time. The 1 inch sheet is the first requirement to give a general picture of the landscape under consideration. It may be asked why, with 1 inch sheets available, it is necessary to draw the contours of the selected portion on the board? First, the enlargement serves to emphasise the features we want to teach and to exclude for the moment the other extraneous matter which the map shows. Secondly, on the blackboard enlargement the teacher can direct the children's attention to the precise point which he wishes to emphasise; he cannot be sure of doing this with each child looking at his own map. Thirdly, the combined use of map and section, appearing as they do closely together, indeed with the one developing from the other, stresses the significance of the joined contours, 1300 feet, 1350 feet, and 1400 feet, to produce the characteristic " edge " as shown on the section. Similarly, the sketches of rock weathering enlarge and select from a more general photograph those features which we want to emphasise, and they are therefore very much more suitable for the purpose than the photograph.

In concluding this section notice again that these examples show the technique of building up a display piece by piece. Each of the lessons illustrated here starts with a blank board and develops upon it a summary of the exposition. This provides a visual experience quite different from a board prepared beforehand. Fig. 44 illustrates this point. The first item to appear is diagram 1. This is built up *from the bottom layer upwards*, labelled a. limestone, b. millstone grit, and c. coal measures; comments are written at the side; notes and diagram fit together. But a class confronted with a completed summary might easily overlook this detail, and interpret the notes incorrectly.

2. PICTURES, DIAGRAMS, MAPS AND CHARTS

These methods of illustrating have certain features in common. A picture may be a complete description but without any particular emphasis; by means of a diagram we select and simplify one part throwing it up into bold relief. A map is a specialised type of diagram, containing some of the elements of both. All three are often used in conjunction with each other. A wall chart is a method of displaying them either separately or together, in a form large enough to be seen from a distance, and with distinctive qualities of its own.

In this section some general principles common to all illustration are first set out followed by a separate discussion of their individual characteristics.

SOME GENERAL PRINCIPLES

(i) *Focusing Attention.* In any illustration there are " dominant" and " subsidiary " elements, or the " figure " and the " ground ". The " figure ", the dominant feature, should be able to capture the attention without having to compete with rival attractions.

The advertisers know this well enough and any successful advertisement has its striking feature which catches the eye. The attention cannot be in two places at once. It may rapidly fluctuate from one item to another, as it will if the content of a picture is overwhelmed with unnecessary detail, if a diagram is confusing, or the form of a map ambiguous. It helps educationally, if the " figure " of an illustration is the principal item to be taught ; it hinders psychologically if there is some other prominent feature or irrelevant background detail which distracts the attention from the point which the teacher wishes to make.

It is not always easy for the eye to pick out which is the " figure " and which the " ground ".[1] In appreciating configurations there is a tendency for the eye to go for those elements which stand out from their ground by reason of distinctive shading or luminous colour, figures with completely enclosed line, figures which have a strong emotive quality or which are very familiar. It is more difficult to perceive configurations which are the same colour or brightness as the ground, which are uncontoured, or very complex.

(ii) *Colour.* Luminous colours possess an inherent attractiveness of their own, consequently a picture with its principal features so coloured compels attention more readily than a similar one in black and white. Luminosity is the quality in a colour which tends to make it remain visible when the light fades. White is the most persistent ; yellow and the colours near to it on the Ostwald colour circle come next. Black, purple and the allied colours are the least luminous.[2]

Luminosity of colour is important in illustration used in teaching for much of the work is done at a distance and in imperfect lighting, and also because brilliance appeals most readily and attracts attention.[3]

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[1] See M. D. Vernon, *Visual Perception.* The application of this principle to map making is given in Chapter 4.

[2] See Ostwald, *Colour Science* or Winsor and Newton, *The Ostwald Colour System.*

[3] See for example, the pictures of cocoa plantations issued by Messrs. Cadbury, Bourneville.

Brilliance alone is not enough ; a harmony in colour needs to be taught. Generally a combination of colours from opposite sides of the colour circle is found to be most attractive. A predominance of hues which are alike requires a contrasting colour to balance and to relieve what would otherwise be a flat or drab effect. Further, emphasis can more easily be given and detail more readily discerned in an illustration which has a discreet harmony of colour.

Colours have specific psychological associations. Reds and oranges have a warmth about them and give a sense of comfort and well being. Certain shades of blue and green convey the impression of cold ; " ice-blue " for example describes the colour quality in terms of its associations. Similarly, we speak of a " dark brown " voice or a " black " rage, interpreting sensations of one kind in terms of another. This is not merely a matter of mixing the metaphor. It is quite literally a mixing of the emotions for which the psychologists, as always, have a phrase—" synaesthesia " —a " running together " of the emotions. This aspect of reaction to colour is an important element in visual perception and when choosing colours for display it has to be borne in mind what the psychological impression is likely to be.

(iii) *Aesthetic Quality*. We should all give support to the perennial task of cultivating good taste in the schools. Standards are absorbed incidentally and imperceptibly through being in daily contact with visual experience of high quality. It is not sufficient that illustration used in teaching should be merely instructive. It must be pleasing and attractive and well balanced so that the first feeling aroused is pleasurable. This in itself assists learning. In contrast an illustration which is crude or grotesque, or which ignores the recognised conventions of proportion, establishes a natural aversion which does not invite any sympathy with its subject.

(iv) *Intelligence and Visual Perception*. It is sometimes said that illustration is appropriate for the dull and backward whereas the spoken word or the printed text is more suitable for the intelligent.

Visual perception involves the physical process of seeing and the intellectual process of interpreting what is seen. Mann and Pirie describe an interesting experiment.[1]

It is quite possible to take a maturing hen's egg and to detach that portion of the embryo which will eventually become the eye—the little eye-bud as it were. This eye-bud can be kept growing in a test tube in suitable conditions of warmth and nourishment until it is quite recognisable as an eye, alive in so far as it will perform the processes of seeing but not connected to any brain which can interpret them. Therefore it is scarcely correct to speak of seeing at all in this case since the psychological function is entirely absent.

---

[1] Mann and Pirie, *The Science of Seeing*.

Perception therefore implies the existence of eyes to see and a brain to interpret. In fact the more efficient the brain is, the better in a sense do we see, in that *what* we see has greater significance for us. The combination of a superb brain and an indifferent eye-mechanism is better than an indifferent brain and a superb eye.

It is not unreasonable to assume that intelligent children will see far more in a given picture than dull children. The intelligent person will be able to appreciate its significance, to give his attention more readily to the salient points of it, to keep his attention there more constantly and to understand relationships between information gained from illustration and information acquired elsewhere. He is better equipped to use this source to the full and to get the most benefit from it.

The dull child is less likely to do these things. To him an illustration means very much less ; it remains just a picture.

Now let us consider these types of illustration separately :

(1) PICTURES

A picture is not a pleasing diversion. It must be chosen specifically for a purpose, the first and most probable being to replace or at least to reinforce with an authentic visual background the erratic impressions which imaginative children create so freely for themselves.

This is not always an unmixed blessing. In those subjects where personal interpretation counts for so much, the imaginative mind may well feel irked by the restrictions of a picture which represents the interpretation of another. I doubt whether this is true in most geography teaching where the matter is more factual and where a well chosen picture can reveal information with an economy of time and effort.

But a picture is not only *instructive*. It may arouse an emotion, either of wonder or of admiration or awe, or simply of pleasure or aversion. Or it may *stimulate* imagination, a desire to find out more or to solve some problem which it suggests. If therefore the principal question from a picture which is primarily instructive is "What do you *learn*"?, the picture which evokes an emotion will ask "What do you *feel*"?, while that which fires the imagination asks "What do you *think*"? It is just a question in each of these cases whether the picture is principally *instructive*, or *emotive*, or *stimulating*. It may well contain elements of them all and it is largely a matter of how the picture is used as to which of these predominates.

Choice of Pictures. Illustration is not merely a matter of pinning up the first picture which comes to hand. There are so many available that a careful selection can always be made according to the purpose which it is intended to fulfil.

First it must be strictly *relevant ;* a generalised idea is not good enough and may be actively misleading. Pictures showing street scenes in large towns are rarely characteristic of life in the countries which they represent. Most of the world's principal cities are cosmopolitan and one street scene looks very like another and in any case they have little geographical significance. Illustrations describing foreign countries are best found outside the large cities where life and landscape are more regional and reveal more clearly their own individuality.

We must not go to the other extreme and insist upon traditional local associations whether the subject demands it or not. There is an amusing reference to this practice and an implied warning in Sir John Adams' *Exposition and Illustration*, which I quote:

> The scene is a publisher's office. Mildmay the Art Editor is discussing with Martin the Literary Editor, the illustrations submitted for an Egyptian story in a magazine.
>
> Martin begins: "Where is the Sphinx?"
>
> "Not mentioned in copy" said Mildmay, moving a little further behind Martin's chair.
>
> "Where are the Pyramids?"
>
> "The story contains no reference to Pyramids" said Mildmay.
>
> "But—but—but—you know better than *that* Mildmay! the editor protested, shocked and trembling. "... here's a picture for a story about Egypt, and not so much as a Sphinx, or a Pyramid, or anything at all to suggest Egypt in it!"
>
> G.T.G.

In addition to individuality I like to see a picture convey an air of life and vitality unless the subject expressly forbids it. Children are interested in persons, and particularly in other children.[1] "Dead" pictures with no indication of human activity have little appeal for them. Landscapes are not so many inanimate specimens devoid of human contacts. How very much more stimulating are those illustrations which show people—and children—going about their business in their usual fashion; the hurry of people upon the roads; a line of planters in the rice fields; a bustle of tugs on Southampton Water; these things are part of the natural scene. For the geographer the chief interest is in the intimate relationship between men and the background they live in and the marks of human life are a part of the pattern.

It is not enough for the picture to be geographically correct. It must be educationally sound, properly balanced with a pleasing proportion, emphasising the essentials while suppressing things of lesser importance thus directing the attention to where it is wanted. It is not difficult for the photographer to do this with a judicious use of camera angles selecting view points which the eye normally does not see or with skilful use of aperture and focus, bringing out a feature in sharp relief while deliberately suppressing irrelevancies in the background.[2]

Further, the focus of attention must be in the right place. A picture which has its principal items at the sides has a disturbing effect which detracts from its educational and aesthetic quality.

The Use of Pictures. Having established the purpose and made a choice let us now examine the possibilities of using pictures to the best advantage.

We have seen that children vary in their ability to learn from illustration. Intelligent and dull children will get different things from the same picture. This is not to assume that the intelligent child would learn equally well without it or that the dull child learns nothing at all from it. On the contrary they will both derive educational benefit only to a different degree and of a different sort.

[1] This is shown in the series ot films entitled, *The Earth and its Peoples* in which children invariable play a prominent part.

[2] Skilful use of the camera is shown so well in *English Churches* by Hutton and with photography by Edwin Smith. There is an exceptional quality and a wealth of detail in the photographs due in part to a careful selection of vantage points and also to the way in which his camera focuses attention on essentials while quietly pushing away lesser matter into the background.

Both will profit by being taught how to " read " a picture properly, the intelligent child reading much more from it and applying the knowledge better than the dull.

It is a curious fact that there is a tendency for children to " recall " details which are not there.[1] A lively fantasy will encourage the mind to run on, soon to associate with a picture additional matter which they think *ought* to have been there, or which they wish *had been* there. Consequently there is a possibility that much of what we think is perceived, is in fact inferred ; and when we are dealing with factual matter, it is as well to be objective without being unnecessarily pedantic. Therefore it is necessary to train children to pick out the detail and to encourage subsequent inferences to rest rather more on fact which can be seen, and less upon fantasies which are all too readily assumed. Children soon come to realise that a thorough analysis will reveal far more than a cursory glance.

Intellectual application by the more able must lead to comparison with other sources and appropriate relationships educed. This is just another facet of the fundamental principle which a teacher of geography must constantly bear in mind namely—that geography is not purely descriptive nor a matter of acquiring facts only but that having acquired them, one should then reason about them and where appropriate observe relationships between them.

Picture analysis is very thoroughly dealt with in the series entitled *How to look at Geographical Pictures* by Watkins.[2]

In these books representative illustrations are selected and the questions set require the pupils to dig deep, understand the geographical significance of the picture as a whole, seek for reasons, offer explanations, search for detail which would otherwise be missed, make inferences, and to look further in other sources for information which the picture suggests.

An example of picture analysis

Figure 46 is a picture of the bazaar in Darjeeling.

Find Darjeeling in the atlas.

1. What country is it in?
2. And what state?
3. What is its latitude?

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[1] See for example, F. C. Bartlett, *Remembering.*

[2] See also for example, *Reading Pictures* by Ginn & Co.

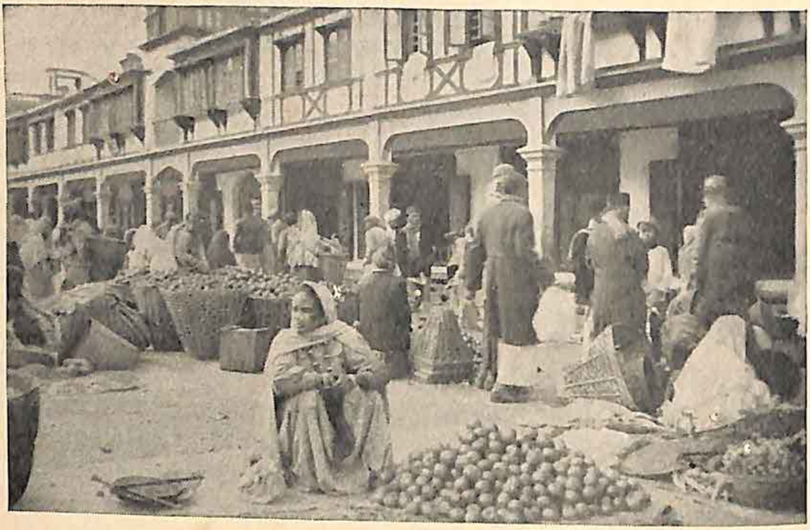

FIG. 46

4. And its height above sea level? Find out its approximate temperature :
5. In summer, and
6. In winter.
7. Is this temperature customary for places of this latitude?
8. What is the reason for the difference?
9. Find out the approximate rainfall here.
10. When does it fall?
11. What evidence do you see in the picture which will give an idea of the climate here?
12. What time of year would you say this picture was taken? Why?

Describe the clothing of :

13. The woman squatting in the foreground.
14. The men standing in a group at the righthand side.
15. The small boy standing behind them.
16. How does their clothing compare with the clothing of other people in other parts of India better known to you?

Look at the baskets :

17. What do you notice about their shape?
18. How are they carried?
19. By whom, the men or the women?

20. What is the fruit shown here?
21. How heavy would you say a basketful would be?

The features of these people are not very clearly shown, but the woman in the foreground can be seen clearly enough to get an impression:

22. Describe her physical appearance. It is typical of the people who live in the hills of Nepal, Bhutan, Sikkim, Bengal.
23. Find all these places in the atlas.

Some of these are the people who provide the porters for the Everest and other expeditions.

24. What are the names of the tribes who are famous as Everest porters?

These points are not exhaustive but they do show the possibilities which emerge from a close study of illustration. The answers can all be discovered, and the children have got to work to find them.

Some appear elsewhere, in atlas or text, as for example in questions 1 to 6, 9, 10 and 20. Other answers are read directly from the picture itself as in numbers 11 to 15, numbers 17 to 19 and number 22. Others demand relational thinking or have to be inferred from information already established; numbers 7 and 8, 12 and 21 are examples.

If systematic instruction of this kind is given during lessons with the teacher directing the search, summarising the facts which emerge and making leading suggestions in those cases where inferences have to be made, then children so trained are well on the way to becoming self reliant in seeking for information themselves.

Timing. In analysis of this kind the picture is used *during* the lesson. There are several methods.

The *individual* copy, such as an illustration in a textbook, is useful for detail can be seen clearly enough. However it is not always possible to be sure that the children are all looking at the same point at the right time and there is also the difficulty that attention is divided between the picture and the teacher. This tends to slow up a brisk lesson.

Passing illustrations round the class is never satisfactory. It brings up its own problems of discipline and destroys that neat sense of timing which should be employed to keep interest going. Very few can see the picture and these monopolise the proceedings while the remainder either struggle for a glimpse or lose interest and give up altogether.

Very much better is the large clear picture displayed at the front which fixes attention where it is needed. But it must be large enough, otherwise detail is difficult to discern beyond the first few rows. In the normal sized classroom[1] a picture should be not less than 24 inches × 18 inches to be used satisfactorily. Pictures of this size are not always easy to find, therefore it may be better to adopt some method of projection to get a picture large enough for all to see.

It is equally sound to display a picture or a series of pictures before the lesson begins but in this case the object is rather different. Instructions are given to study the display beforehand drawing attention to particular points to look for, and these instructions and any questions which go with them may well be printed and put up as a part of the display itself.

In this way a visual background is provided before the lesson begins, and the teacher has something to build on.

Display. Pictures should not remain displayed longer than they are needed. A collection of illustrations which has been up for half a term, bleached by sunlight and collecting the dust is not very inspiring. The value of a visual display is an immediate one. Its very novelty excites curiosity and as soon as it has served its purpose it should be removed and replaced by another. There is rarely enough display space in a classroom, and we cannot afford to have illustrations occupying valuable space when they are no longer topical.

Mounting is quite essential, not only because a picture soon deteriorates without it, but when tastefully displayed and mounted, it becomes a wholly different visual experience. The size of the mount must be sufficient to set off the body of the picture and add substance to it. Generally speaking, a picture which is displayed horizontally is best mounted with an equal margin visible at each side (Fig. 47). A picture displayed vertically appears quite differently when the width of the margin at the top is less than the width at the bottom (Fig. 48). These are not inflexible rules. Variations of the proportion of mount to picture will enhance its qualities by accentuating impressions of height or depth as desired.

Similarly the colour of the mount should be appropriate for the colour and the quality of the picture. Pictures printed in tones of brown are best displayed on mounts of the same colour but of different shade. The general psychological principle holds—that a figure is more easily perceived when it contrasts in shade from its ground. Thus a picture which is light in general tone looks insipid on a light mount. Its character alters completely when mounted on a darker shade. Coloured pictures are best displayed on mounts which reveal the overall colour quality. A subdued shade is more suitable for a mount than a brilliant tint.

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[1] Building Regulations 1945 gives the "normal" size as 780 square feet.

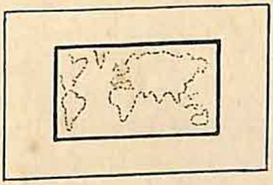

FIG. 47

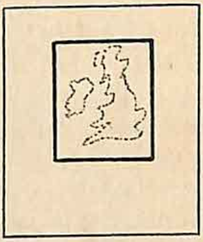

FIG. 48

The result is not simply a picture plus a mount. The whole becomes very much greater than the sum of its parts for with colour and proportion in keeping, it takes on an entirely new character and the aesthetic quality is very much improved.

Fixing. The mount also serves a practical purpose. The picture is preserved; the corners of the mount are prepared to receive drawing pins by punching a hole (Fig. 49) which can be eyeletted, although a plain hole lasts very well. Another more robust method of fixing is to use tabs at the corners (Fig. 50).

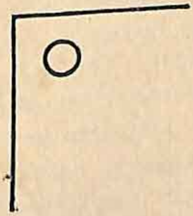

FIG. 49

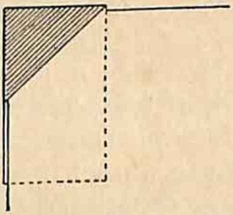

FIG. 50

The pins are pushed through the back of the tabs so that they are completely hidden and there is no wear on the corner of the mount.

If coloured tabs are used to match the colour of the mount they add considerably to the decorative effect of the display as a whole.

* * * * *

(II) DIAGRAMS

Diagrams are used principally for two purposes:

(*a*) *To select from a picture, detail which is in need of closer attention.* Thus from the picture in Fig. 51, the diagram in Fig. 52 has taken certain details of construction, simplified them, and removed them from their surrounding context which tends to obscure them. Similarly, certain detail of the landscape in Fig. 53 is analysed in the diagram in Fig. 54. This shows how description may be enhanced by a combined use of picture and diagram. They are in fact the complements of one another, the picture being a general description, the diagram an analysis of its various parts. The principle is extended in block diagram, as in Fig. 55 which strips a landscape of its surface features so that the attention is directed for the time being to the structure. It is used also in a technique which may be described as " physiographic mapping ", where relief is mapped in the rather unconventional method of employing little formal pictorial diagrams to indicate physical features.[1] There are limitations in this method common to all forms of pictorial maps and it is not very widely used.

(*b*) *Diagrammatic representation of data.* Formal diagrams are used to express economic, climatic and other factual data.

The simplest is a plain *line*, with the length proportional to the quantities expressed (Fig. 56). The same information can be expressed in vertical *columns* of equal width (Fig. 57) or in *squares* or *circles* of areas proportional to the values.

Each one of these may be *simple* as in the examples above, or *compound*, as in Fig. 58, in which the total quantity is subdivided to show the relation of its constituent parts. The question, from the geographer's point of view, is to choose the most lucid and suitable form of representation for the quantities to be shown. Line, column, square or circle, each makes a slightly different psychological impression. Values which involve *quantities* (of commodities, or of currency) are generally shown best by *linear*

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[1] See Raisz, "The Physiographic method of representing scenery on maps" in the *Geographic Review*, Vol. 21, 1931.

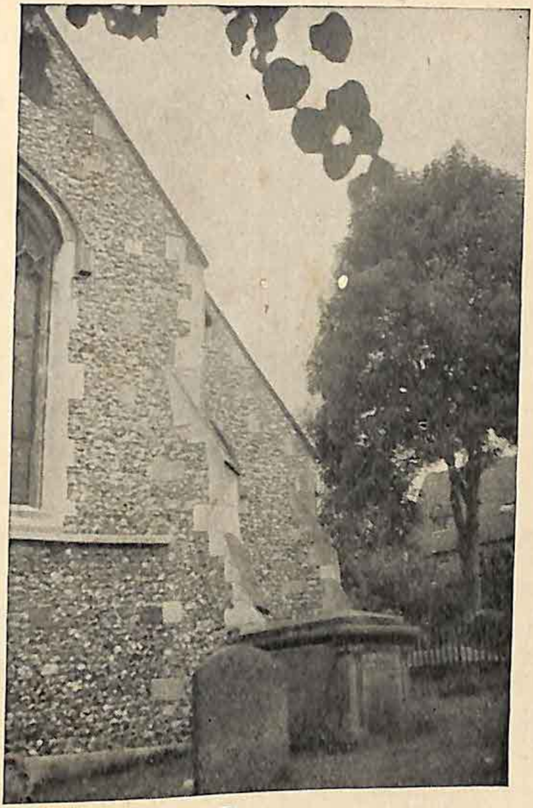

FIG. 51

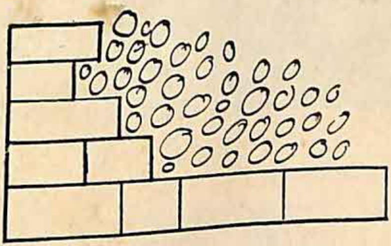

FIG. 52

FIG. 51 shows the combination of flint and freestone in church building. The flint is durable but it cannot be cut square. The Cotswold stone which is a freestone is therefore used for corners and foundations. This detail of the picture is analysed in the diagram, Fig. 52.

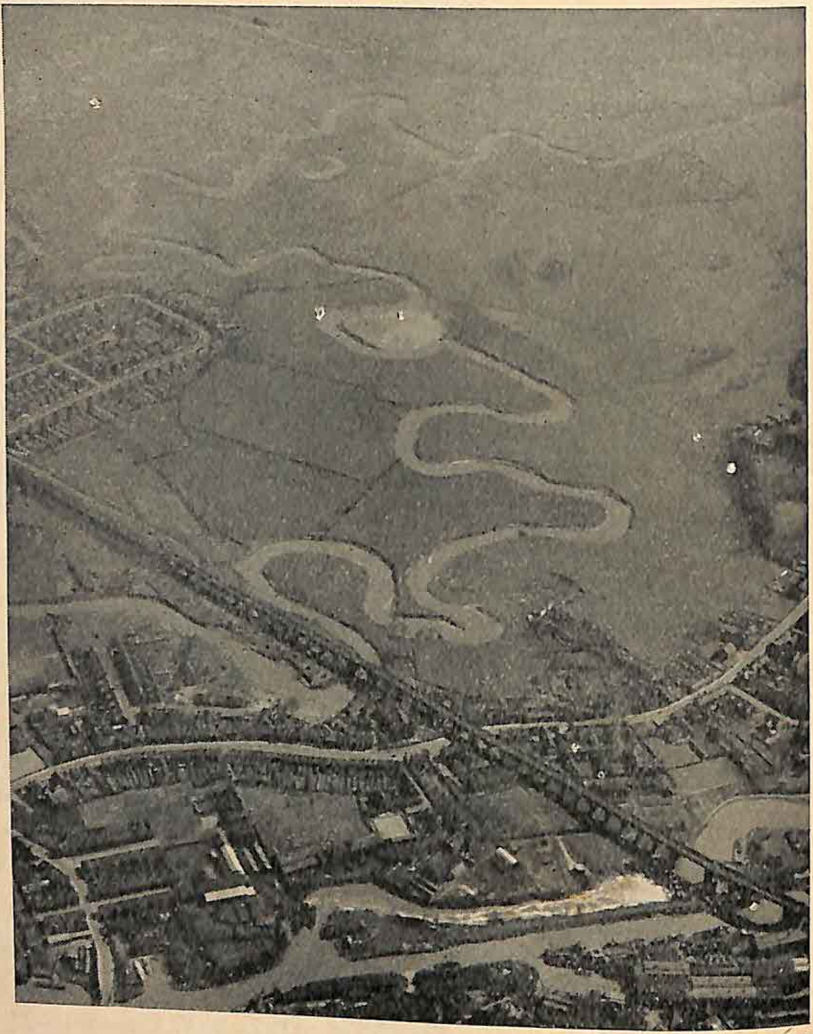

FIG. 53

Aerofilms Ltd.

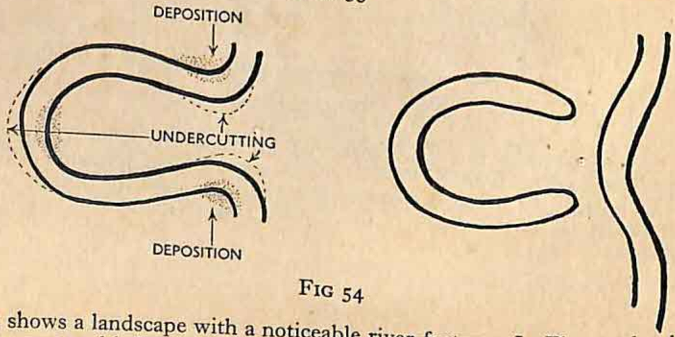

FIG 54

FIG. 53 shows a landscape with a noticeable river-feature. In Fig. 54 the diagram separates this feature from its context and analyses its development.

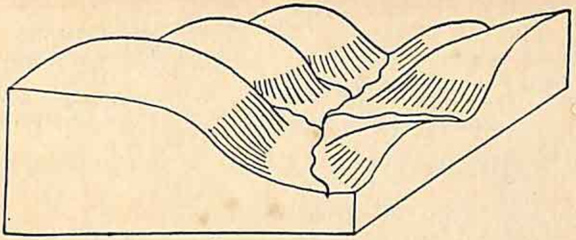

Fig. 55

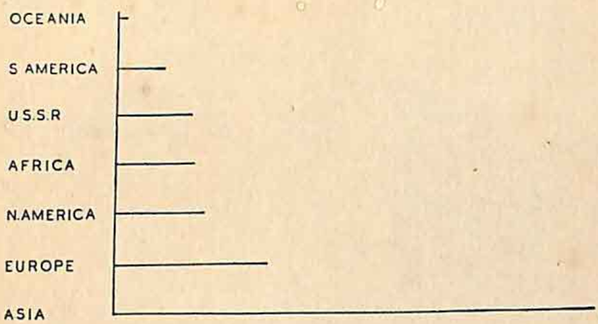

Fig. 56

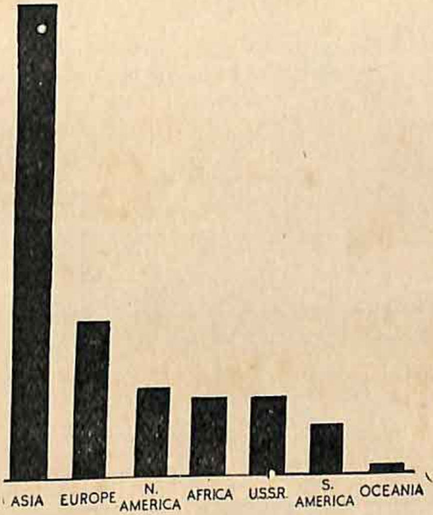

Fig. 57

Figs. 56 and 57 show world population statistics for 1948. The same information is shown in isotype in Fig. 62.

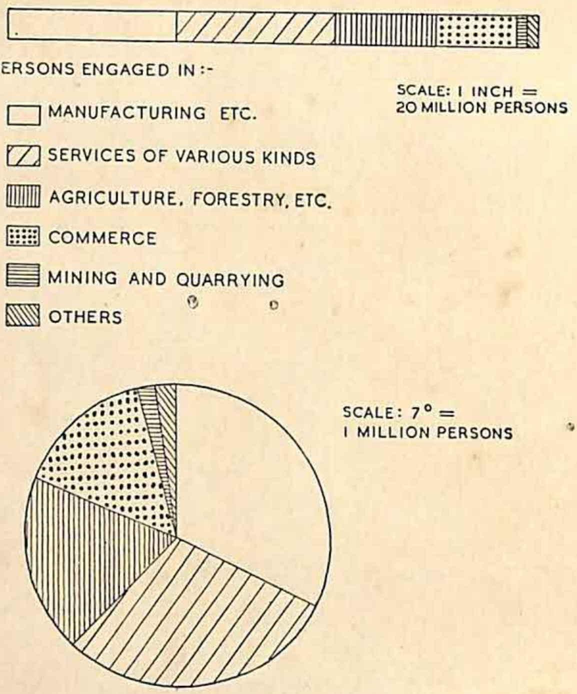

Fig. 58

Fig. 58 shows economically active persons in U.S.A. in 1948, classified by occupations.

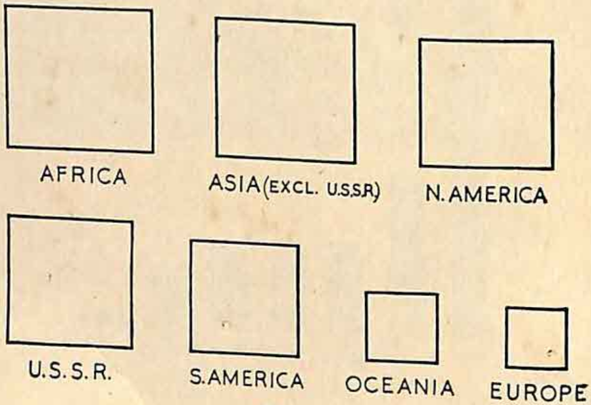

Fig. 59

Fig. 59 shows the size of the principal continental areas represented by proportional squares.

diagrams where the comparisons are readily interpreted in terms of height or length of the symbols employed. *Areal* values (of square miles, or acreage of distributions) are best expressed by *areal* symbols, i.e. proportional squares or circles (Fig. 59).

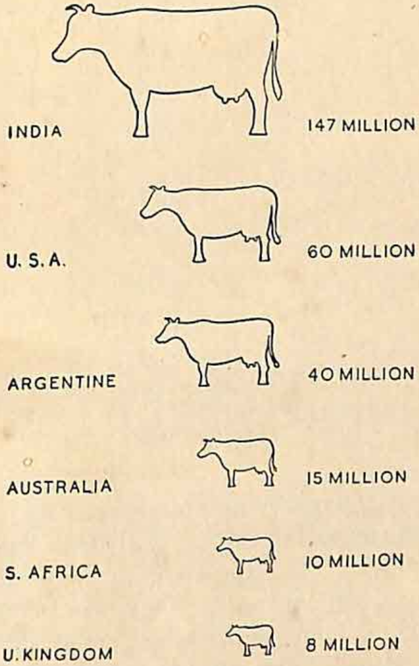

FIG. 60. Principal Cattle-rearing Countries of the World, 1948.

Either has an air of unreality which has given rise to the popular practice of expressing geographical data in terms of *pictorial* symbols similar to the commodities or the objects which they represent. A method commonly employed is to make the size of the symbol vary with quantity as in Fig. 60. This is not always clear to a child. He may see that the one symbol is bigger than the other but *how* much bigger is not easy to tell. The difficulty is partly resolved by enclosing the symbols within proportional squares, the squares themselves being divided into units which represent a stated quantity (Fig. 61). Even this does not give a wholly correct impression for the introduction of pictorial symbols involves *depth* as well as area. Thus in Fig. 61 the sacks ought really to vary in cubic capacity rather than in surface area.

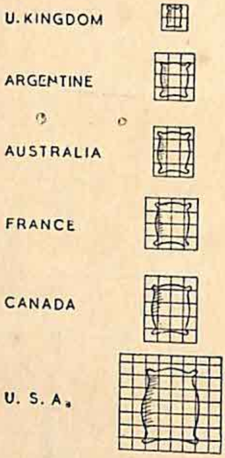

FIG. 61. Principal Wheat Producing Countries of the World in 1949. Each small square represents 500,000 metric tons.

It is much more correct to choose a symbol of standard size which represents a specific value. Varying quantities can then be shown by employing the requisite number of symbols as in Fig. 62. This gives a general impression which is more realistic than the line or the column, and its accuracy can be verified by counting. Symbols of this kind have been standardised by the *Isotype*[1] system of Otto Neurath to produce as it were, an international picture language for the interpretation of economic and other factual data.[2]

Graphs in the true sense, i.e. curves which are the result of joining together points plotted to a vertical scale (the ordinates),

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[1] I nternational
S ystem
O f
T) Typographical
Y)
P icture
E ducation

[2] See Neurath, *Isotype Dictionary. International Picture Language.*

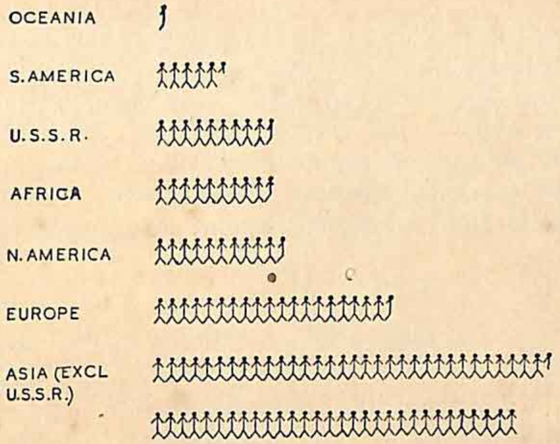


FIG. 62. World Population in 1948 is shown in isotype form, one symbol representing 20 million persons. Where there are many symbols used, they can conveniently be spaced out in groups of five.

and to a horizontal scale (the abscissae), are usually reserved for economic and climatic data which show variations in value over a period of time (Fig. 63). Graphs are swiftly and easily made. They summarise a wealth of information with an economy of time and space, and their detail is easily read. Comparisons or relationships are quickly revealed from graphs which are plotted to the same scale when they are used together, either adjacent to one

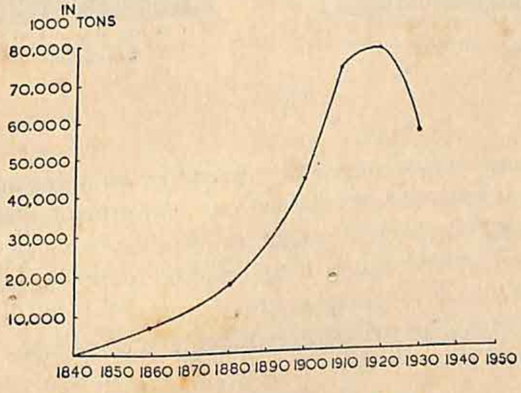


FIG. 63. British Coal Export Trade, from 1840 to 1940.

another, or superimposed upon one another. Children should be familiar with the practice of expressing information in graphical form as soon as possible, certainly from 12 years, not only because graphs are so lucid, but because like sketch maps, they are so convenient later on for summarising factual matter quickly and clearly in a form which can be easily memorised. The characteristic profiles for different climatic regions are examples (Fig. 64).

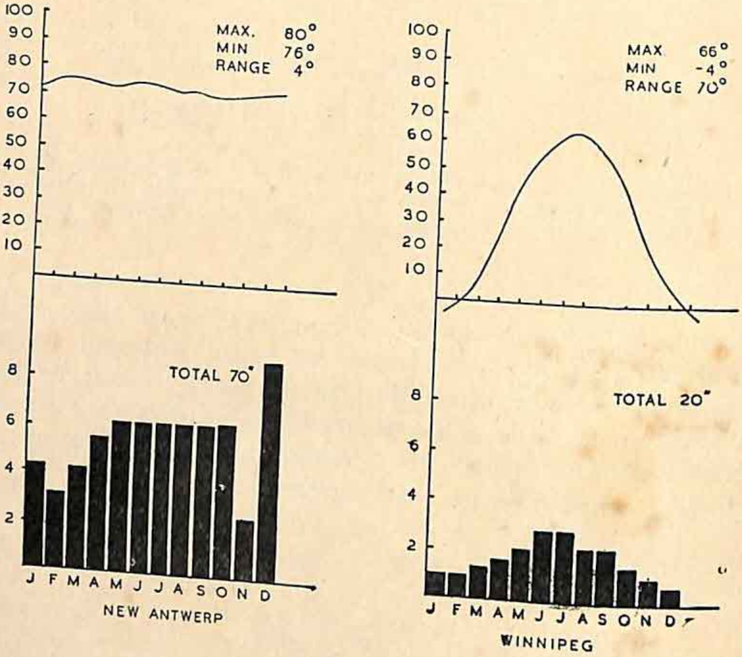


Fig. 64

Located diagrams, i.e. any of the above located in the appropriate places on a base map are sometimes convenient. Significant variations from one region to another are thus brought out (Figs. 65 and 66). The limitations of the method lie in the fact that the diagrams may easily overwhelm the map and destroy its pattern, and if the system is overdone it is difficult to discern the character of the map at all.

* * * * *

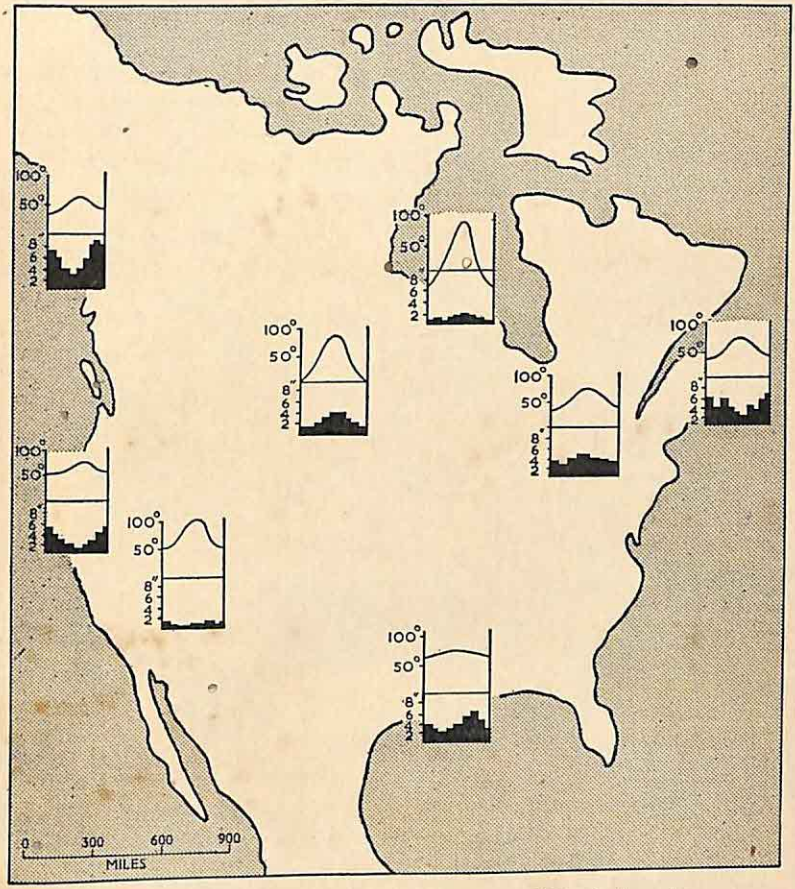
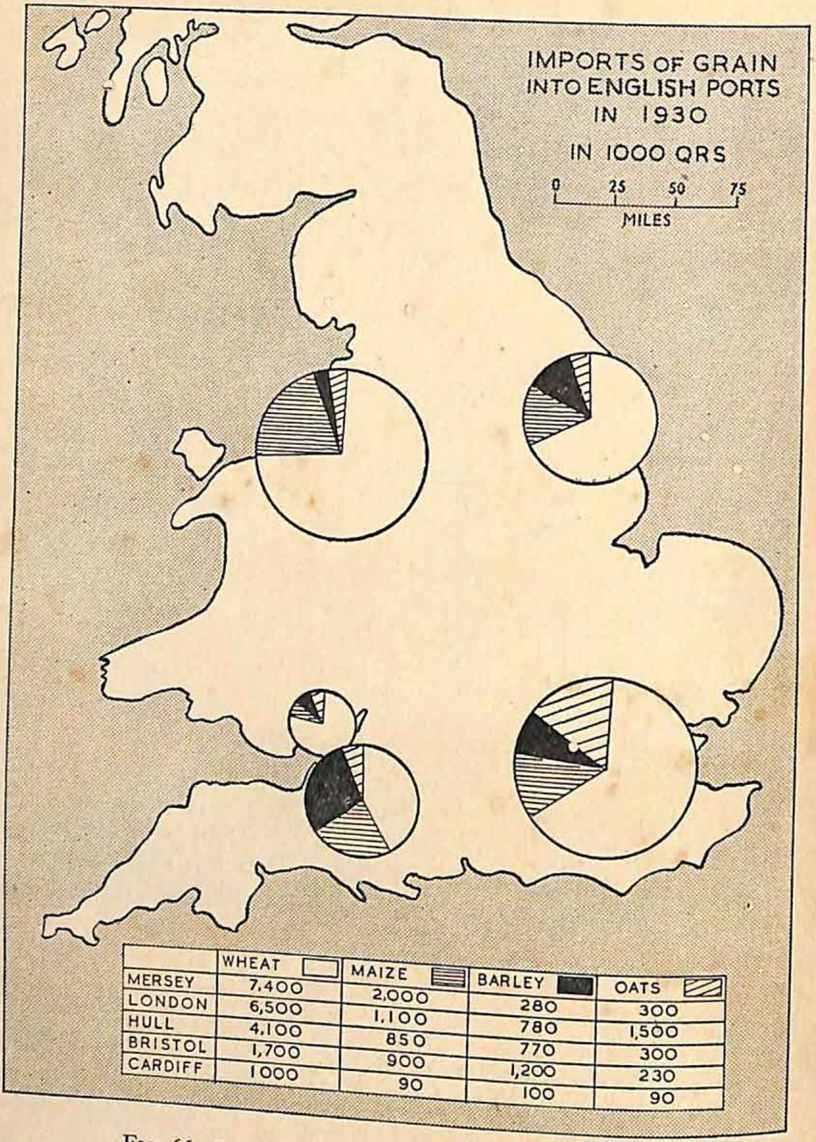


Fig. 65. Climate Profiles located on a map of North America.

(III) CHARTS

Any of the illustrations mentioned so far may be used together to form a wallchart. These are of two kinds:

- (*a*) Diagrams or maps executed on a scale large enough for all to see. The technique is more akin to poster work with simple pattern and bold line. Fig. 67 is an example of a simple chart of this kind.
- (*b*) More commonly, geographical wallcharts are pictorial. They are either published commercially or made in school. In fact the school-made chart is not really a wallchart at all. It is a *visual display* of illustrative matter which might



	WHEAT ☐	MAIZE ▤	BARLEY ■	OATS ▨
MERSEY	7,400	2,000	280	300
LONDON	6,500	1,100	780	1,500
HULL	4,100	850	770	300
BRISTOL	1,700	900	1,200	230
CARDIFF	1000	90	100	90

FIG. 66. Diagrams of Economic Data located on a map of England.

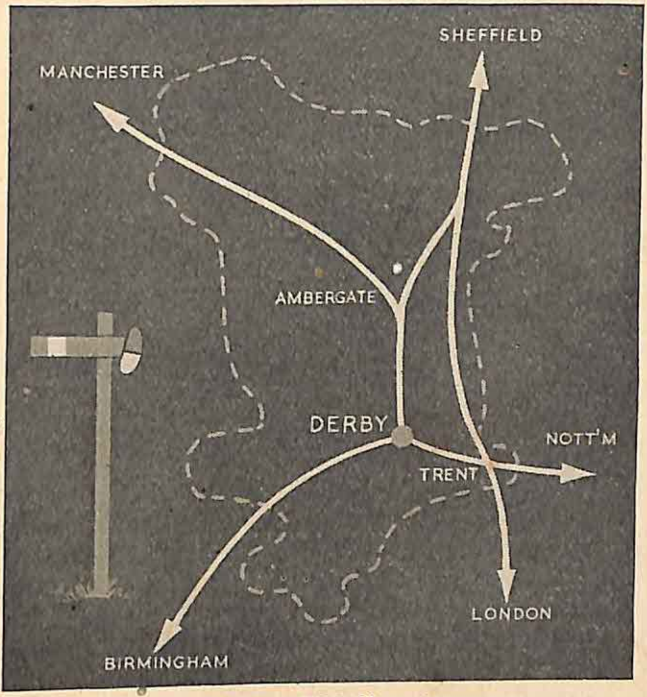


FIG. 67. A Simple Wall Chart drawn with crayon on sugar-paper.

otherwise be exhibited on pin-rails. There are objections to pin-rails. All pictures do not fit the space between them, and they get curled and torn. But the real objection is that the pictures must necessarily be strung out in a line, and this does not make the best use of them. There are times when it is better to group them together around a map, with leaders running from the pictures to the appropriate places on the map, or around an explanatory text.

A Composite Chart of this nature is a most effective device. It becomes an instructive unit in its own right, the individual components of it adding weight to each other. If any one of them is taken out, it becomes just an isolated picture, rather meagre by itself. But in its proper context with the others it adds to, and is itself enhanced by the contribution of the other parts, thus increasing the educational value of the whole unit. Much of the value of this work lies in the preparing. Once children are interested in it they become enthusiastic for it, and after initial instruction in the elementary principles of display, they will take over the selection of material, trimming to size, mounting and arranging with maps and texts if these are needed.

The principles which govern visual display in composite charts are seen in the following examples:

The Everest Reconnaissance Expedition 1951. The arrangement of this display as a composite chart eventually emerged as: the position of Everest and its height; the "old" and the "new" routes in relation to physical conditions and changing political events; bases and communications; special difficulties arising from climate, atmospheric conditions and terrain; the personalities involved; the history of previous expeditions; other formidable peaks. Geographical matter arising from these topics can only be hinted at in a display of this nature. If it is allowed to be too comprehensive it becomes unwieldy and takes up too much time after the initial interest has passed. Psychologically the purpose of this kind of work is to capture attention in the first instance, to fire the imagination, and thus to serve as a stimulus to find out more.

The *structure* of this display (Fig. 68), resolved itself into: a map; diagrammatic sketches of the "old" and "new" routes; photographic matter covering the physical, climatic and human sides of the project; topical press cuttings which do likewise; a diagrammatic representation of other peaks showing their heights and locations; and a diagram showing the achievement of previous expeditions to Everest, including the Houston air expedition of 1933. To stimulate a more extensive study of these topics there is a small panel carrying suggestions and a reference to the reading which will deal with them.

When arranging a chart of this kind it is often a good principle to provide a large central focus. In this case the focus is a bold map with only sufficient on it to show the names of the countries immediately concerned, the minimum of physical structure, the names of towns immediately associated with the expedition, and Everest itself marked boldly with its height. Around this focus other matter is grouped neatly according to subject. Individual items are separately mounted and pinned to the backing of the whole display. It is rarely advisable to stick separate illustrations on to large sheets of backing paper. They may be needed again elsewhere.

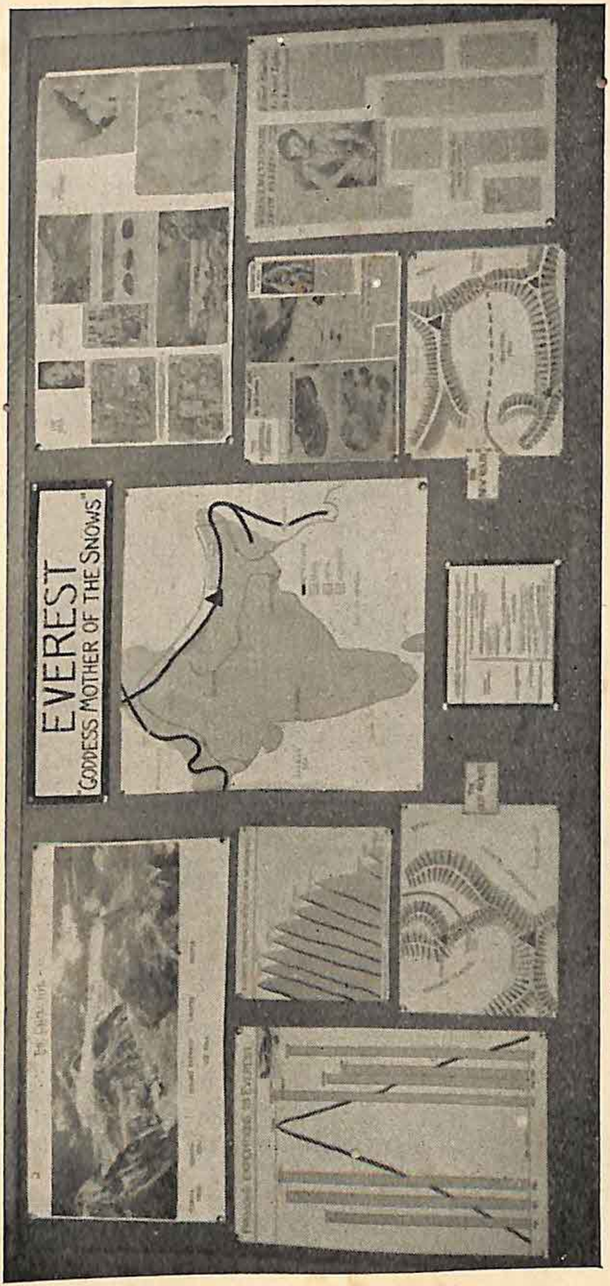


Fig. 68. A Visual Display of The Everest Reconnaissance Expedition 1951.

DRAWING AND LETTERING

A special word is needed concerning the making of diagrams and maps for wall display. The technique is wholly different from the ordinary processes of cartography. For this work we do not need meticulous accuracy ; we need bold, firm lines and clear contrasting colours which can be seen from a distance. Often all that is necessary to transform a poor chart into a good one is to increase the thickness of the lines. Lines of suitable thickness and printing of proper height can be done with the special " Uno " stencil pen, with the broad nib, the reed-pen, brush, or coloured crayon. Lettering should be simple and effective not decorative, and it should be planned as an integral part of the display. Waterproof coloured inks should be used.

Suitable sizes and thicknesses are given below :[1]

Thickness of line to be seen comfortably from :

Distance (feet)	*Thickness (inches)*
4	$\frac{1}{32}$
8	$\frac{1}{16}$
15	$\frac{3}{32}$
25	$\frac{1}{8}$
50	$\frac{3}{16}$

Size of printing : Height of Letters in inches.

Distance feet	*Large*	*Easy to read*	*Fairly easy*	*Possible*	*Difficult*
70	4	$2\frac{1}{2}$	$1\frac{3}{4}$	$1\frac{1}{4}$	$\frac{3}{4}$
40	3	2	1	$\frac{3}{4}$	$\frac{1}{2}$
20	$2\frac{1}{2}$	$1\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{4}$
10	1	1	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{3}{16}$

Principal titles should be large. Sub-titles may be necessary to group information, in which case the printing should be somewhat smaller to avoid distracting from the main theme.

COLOUR

Some suggestions on those qualities of colour which help to attract attention and to create a desired psychological effect, have already been discussed. The editor of a wall chart can give even more attention to these qualities for he has a greater control over them in his choice of backing-paper, mounts, colour of diagrams or maps.

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[1] These tables are given in *Look and See* by Colin Beale. They are reproduced here by courtesy of the Edinburgh House Press.

In this example of the Everest Expedition, the object is to induce the beholder to " feel " the extreme cold and the rugged uncompromising hostility of the Himalayan scene. To this end the general scheme is in a " cold " colour, in shades of green using a light pastel green for the backing paper and a slightly sharper tone for the mounts and varying shades for map and diagrams. The formal peaks in the diagrammatic schemes on the left are capped with white. The finished effect combined with the icy detail of the pictures gives a powerful impression of glacial bleakness, one observer remarking : " It makes me *shiver* just to look at it."

A second example (Fig. 69) arose from the suggestion of a B.B.C. feature programme on the tsetse fly. Certain points of this broadcast captured the imagination, such as the lack of cattle and consequently the lack of proper diet and of balanced agriculture ; the disease—the " wasting sickness " which is a constant danger ; the methods of prevention and cure coupled with the names of Kerr, Garnett-Davie and Rose ; burning the undergrowth and soil erosion—the surface of Africa being literally washed out to sea, staining the surface of the ocean far beyond the mouth of the Zambesi ; spraying from aircraft. These various topics suggested the need for more systematic instruction which quickly came and also the possibility of unifying these associated problems in a visual display. The arrangement of it was planned as before with a large central focus to take the eye at once, in this case a sketch of the tsetse fly in white upon a black ground. " The Land and its People " is the title of the left hand side of the display, with appropriate distribution maps showing natural grassland and distribution of cattle. On the right the perennial problem of battling against disease through scientific research and popular education is shown in subsections. Below, a brief text states the principal problems with questions and an appropriate list of reading.

Line and printing were executed in bold style. The general scheme of colour this time was brown and green suggesting symbolically the subtle and rather depressing combination of natural grassland and wastage by surface erosion, so prominent a feature of the problems associated with East Africa.

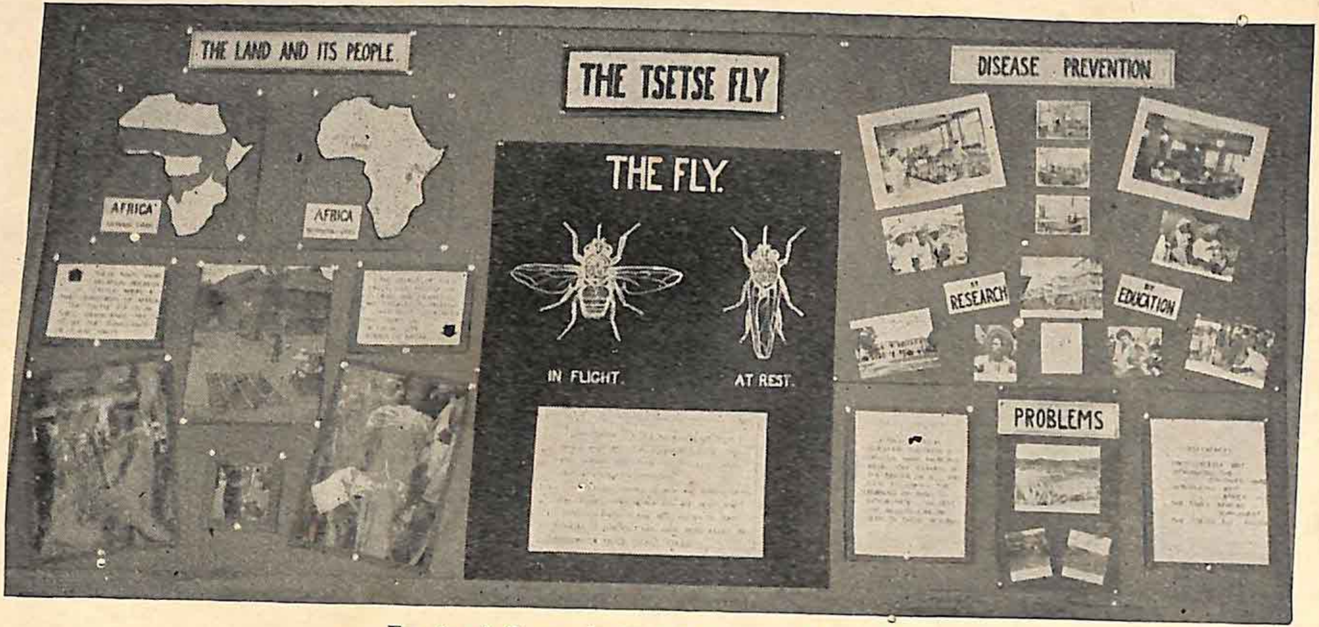

FIG. 69. A Composite Wall Chart : The Tsetse Fly.

3. Projected Pictures

Projection has no magical properties which make a teacher's job any easier, indeed it can do precisely the opposite unless it is used with imagination and some degree of technical competence. The reason why a teacher may need projection is just this: to produce a picture large enough for the whole class to see at the same time. It is a specialised form of display; it is as simple as that.

METHODS[1]

The methods are these:

(i) An episcope, or
(ii) Any of the diascopes, viz: Lantern, Film Strip Projector, Cine Projector.

(i) *The Episcope.* The usefulness of the episcope lies in its ability to show upon the screen a large picture of *any* opaque object —a photograph, a map, a page from a book—in its own colours and without special preparation of the material. But its optical system is such that there is a considerable loss of light in unwanted directions, consequently its picture is never very brilliant and the room must be perfectly dark. The drawbacks of the episcope derive from this.

In the first place there is the importance of *timing*. At the correct moment the picture should appear in support of the teacher's argument. It is never quite the same if there is a pause to darken the room for the spell is then broken and continuity is lost.

Secondly there is inevitably a certain loss of personal contact between the class and the teacher who uses inflexions of voice, gesture, and manner to convey not only his ideas but his own personal force. A class reacts to this personal stimulus; a bond is established which is a very real element in teaching and this is difficult to maintain with a class which you cannot see.

Thirdly it is often convenient to use other material when an illustration is displayed; to elaborate points on the blackboard; to refer to an atlas; to make notes or to sketch a map. These things cannot be done in darkness.

Finally, the classroom very quickly becomes stuffy when the windows are totally blacked out. Few things are so enervating as a lack of proper ventilation, and teachers who have experienced this will know how quickly children become listless and restless for physical fatigue soon follows.

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[1] Technical details of operation of the apparatus are given in Appendix 3.

For these reasons the episcope remains an instrument with very severe limitations in spite of its versatility.

(ii) *Diascopes.* All forms of diascopes—the lantern, the filmstrip projector, and the cine-projector—work on the optical principle that light is shone *through* a transparency on which the inverted picture is printed. With this method very much more of the light from the source is usefully employed resulting in a much brighter picture. This increased brilliance at the screen makes it possible under suitable conditions of room layout and lighting to operate quite efficiently in daylight, or at least in controlled daylight. This involves the use of the technique known as *rear-projection*[1] which puts the projector at the front of the room. The implications of these things from the teacher's point of view are easy to see. He can now do what he wants to do namely, teach in his natural way and in his natural position in front of the class with all his tools ready to his hand, and in addition he can produce his picture precisely when he wants it without all the fuss of darkening the room and the disturbance and delay that go with it.

The instruments used to give still pictures are the *lantern* and the *filmstrip projector.* The lantern takes 3¼ inch slides and it is rather cumbersome. Slides are bulky, heavy and liable to be broken. Consequently it is used rather less nowadays, giving place to the smaller, handier filmstrip projector using 35 mm. strip. Fifty pictures in this form take up very little space by contrast with a box of fifty slides. They cost very much less to produce and are not so liable to damage except of course from gross misuse. On the other hand a picture from a filmstrip will never have that sharp definition which comes from a really good slide.

USING FILMSTRIP

It is rather ironical that the principal attribute of the filmstrip—the ability to produce a large number of pictures economically in a small compass–is at the same time its greatest potential danger. Most filmstrips contain 20, 30, 40 or more frames. Like all other manufacturers the producers must sell their product. Not unnaturally therefore, filmstrips are made which within the limits of their title have the greatest appeal to the greatest number of teachers who are likely to use them. This wider appeal can only serve a general purpose, it can never be entirely relevant either in content or in frame sequence, to any specific lesson. A teacher is then faced with two alternatives. Either he can forego his independence and model his lesson on the strip as he finds it (and in practice this usually means screening unselectively 30 frames simply because they happen to be there), or he may plan his lesson as he wishes it to be done and then *select* frames to illustrate those parts which need it.

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[1] For details of operation and screen arrangement, see Chapter 11 and Appendix 3.

In my view there is only one possible choice here. The first runs the risk of ceasing to be a lesson at all ; it becomes a picture-show. The second is a much more enterprising treatment of a very useful medium. But selective screening is not always easy. It is a hindrance to be governed by the set sequence of frames in a filmstrip. The chosen pictures may not be consecutive, nor in the same order, nor indeed from the same strip. It is inconvenient to turn past frames which are not wanted and it is a waste of time to change the filmstrip in the projector simply to use two or three frames from each.

It is a convenient practice therefore to cut out selected frames and to mount these as individual slides in 2 inch slide holders.[1]

These slides can then be used in any order and the teacher has complete control over the choice of his illustrations. I do not wish to give the impression that commercial manufacturers invariably produce a heterogenous collection of pictures in their filmstrips with no regard for logical arrangement. On the contrary, filmstrips are very much better now in this respect than they used to be. But I do feel that where the ultimate choice lies with the teacher, then the 2 inch slide allows very much more mobility than the filmstrip.

It is different of course when a strip is made to a teacher's order or when he makes his own. He can then arrange the sequence of frames to suit his own requirements.[2]

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[1] Suitable holders are made by : Neville Brown & Co.—a metal holder with glass plates ; F. L. Dinsdale, The Horsemarket, Kettering—the "Drifix" Pack with glass plates ; Messrs. Newton & Co.—an adhesive pack without glass plates.

[2] See T. L. Green, *Making and Using Filmstrips.* Milner, *Making Lantern Slides and Filmstrips.* Kidd & Long, *Filmstrip and Slide Projection.* Hansell, 35 *mm. Filmstrip Technique.*

Apart from the selective use of filmstrip for lesson illustration, projected still pictures may be used to revise or to summarise a series of lessons given over a period. In such cases a filmstrip may serve in its entirety, as for example, Australia : *The Fight against Drought* by Common Ground. Or it may be preferred to test the children's knowledge through a revision filmstrip such as *The Australia Quiz*, No. 4 by Daily Mail, or the *Map Quiz* series by British Instructional Films Ltd. In these, the children are required to fill in certain details which have been omitted or to name the places shown.

There are other times when it is convenient to hold a typical frame upon the screen while its details are analysed on the blackboard.

In all these cases which represent only a few of the occasions when still pictures may be used it is essential that the various parts of the lesson merge into one another without interruption, for they are dependent upon one another. Illustrated lessons of this kind are very much more effective when daylight is maintained and unwanted distractions are absent.

* * * * *

ILLUSTRATION BY FILM

Films used for geography teaching are broadly of two kinds :

(i) Those which instruct.

(ii) Those which are designed to give a general idea, a preparation or a background of information which has been given or is about to be given elsewhere, although there is a good deal of overlapping of function according to the personal view of the teacher and the way he uses the film.

A film which is intended to be specifically instructional invariably requires further elaboration by still picture or blackboard analysis of some of its parts, and consolidation in suitable work by the children. Thus in a sense it is possible to regard it as a background, yet in another sense it instructs, in that new knowledge is learned from it whether this is amplified later by some other means or not. Again, a film designed to give a general review of material which is covered more fully in another form, for example, the way of life of a people, is not breaking new ground but presenting it again in a different fashion. Such a film may be primarily regarded as "background" but is often instructive incidentally by suggesting new ideas or clarifying detail which was previously obscure.

(i) *Instructional Films.* It is useful to begin by asking what film can do which cannot be done equally well by some other means. The first obvious quality possessed by film is its power to convey the impression of movement. For example, if diagrams are needed, the justification for using film for this purpose would be that the diagrams can be made to move—*animated* diagrams—whereas those on the blackboard do not. *Animation* is most effective in adding instructive quality to diagrammatic work—globes which turn, lines running in as required and fading out again when their job is done; animated arrows which move over a diagram and pick out items of it. These and many like devices all serve to lead the mind on from one point to another. They are revealed very clearly in the *Physical and Mathematical* series by Gaumont British.[1] The following incidents from *Latitude and Longitude* illustrate this technique:

(i) The running-in of the equator around the globe.
(ii) Fading in the outlines of the continents on the clear globe and fading them out again so that they do not obscure the build-up which is about to come.
(iii) The parting of the two hemispheres, with a protractor superimposed upon the plane surface of one of them.
(iv) The solid angle of 30 degrees travelling round the globe while fixed at the centre, with its top arm tracing out parallel 30 degrees north.
(v) The intersection of parallel 20 degrees south and meridian 30 degrees west.

These and many similar examples make up a most lucid sequence of presentation.

Film can employ another device closely allied to animation known as *dissolving*, in order to teach such things as the relations between a picture and a diagram, or between a picture and a symbol. This is demonstrated in an Army map reading film[2] designed to teach the conventional signs of the 1 inch sheet to persons who are not very well versed in them. The object is to point out the similarity between the map symbols and the ground features. In the case of a *railway cutting* an oblique view of the cutting is shown first. The symbol for the railway line is then superimposed upon the picture and the " fishbones " at the side of it are run in by animation. The photograph then fades out and the symbol of the cutting remains, so demonstrating the close relationship in appearance between the two.

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[1] The titles of this series are: *Day and Night*, *Latitude and Longitude*, *The Seasons*, *Great Winds*, *The Moon*, and *Map Projections*.

[2] Army Kinematograph Corporation: *X Marks the Spot*.

The same is done for the church with a spire. A photograph appears first, fading soon to a cross upon the ground. A formal model is built up in animation upon this cross. The spire is added and the complete model fades back to the symbol.

The relationship between symbol and object is probably most clearly seen in the case of contours. A photograph is first shown of a prominent hill feature. The photograph fades to a model of it. Contour lines are run in upon the model by animation. The model then turns over to present a bird's eye view, while the commentary remarks : " Now let's see what this looks like from an aeroplane." The relief features are then " wiped " out from one half of the picture leaving contours only.

To *mask* out a part of the frame is an additional way of focussing attention on to a portion of it—a section of a map perhaps—which is then enlarged for closer inspection.

These special techniques are valuable but it must not be imagined that film provides an exhaustive exposition in itself. What the instructional film can do is to take some particular aspect or topic and present it quickly and clearly, but in every case the principles must be applied and further elaboration on the lines of the film is necessary. Thus *Latitude and Longitude* deals briskly with the conception of angular measurement at the centre of the globe but one viewing is not sufficient and it must be driven home by subsequent teaching. *Map Projections*, another in the same series deals with one fundamental principle namely, that with a light at the centre of a hollow globe shadows of a graticule can be cast on to a plane surface. With the animation of a piece of paper into a cylinder, then into a cone, and then into a flat disc, it is demonstrated that the cylindrical, the conical and the zenithal projections are basically all applications of the same principle. Once this is grasped it is for the teacher to apply it to projections of other kinds, to study maps made on the various projections and to note their properties and uses. Similarly at a rather different level, the film *X Marks the Spot* teaches simply the conventional signs. Subsequently map reading must very obviously be done with map in hand, and through plenty of practice. In each case something else is needed to teach with beside the film, either blackboard and chalk, paper and pencil, atlas or 1 inch sheet, or even a still picture which selects one vital frame from a film for detailed study. These things are best used together at the same time according to the needs of the subject so that the essential points can be followed up there and then.

Therefore instructional films should be short brisk and lucid to allow time in the normal lesson period for consolidating what has been seen, and such a lesson is best conducted in daylight so that all parts of it hang together.

(ii) *Background Films.* There are many films of this kind, some of them made specifically for schools, and others which may well be used to provide atmosphere or local colour, but with only slight geographical emphasis.

THE FUNCTION OF BACKGROUND FILM

As in the case of instructional films, it is pertinent to enquire what this type of film can do which other methods of presentation cannot do so well. Films in this category are principally descriptive, so the alternatives would be either personal narration, a still picture, a visit to go and see, or a combination of these. There is no doubt that these are very powerful agents, but they have their limitations. Personal narration is limited by one's experience, reading and histrionic powers. Still pictures can do much to illuminate the teacher's exposition, and I feel that a succession of stills can very often deal quite adequately with a topic which has received film treatment. The visit is not always so profitable as one is led to believe. For one thing it consumes an enormous amount of time, and school pupils are not infrequently overwhelmed by the weight of what they see, even though they may have been well briefed beforehand. This is particularly true of visits to industrial concerns which can be very confusing and have so many distractions that pupils come away hot, very tired, and having learnt very little.

Films of a general nature can surmount most of these difficulties. They will bring unfamiliar scenes into the classroom with a wealth of authentic detail and description. They can compress into a brief space events which might cover a lifetime, or indeed several lifetimes. But very much more important than these versatile powers of description is the degree to which film may exercise an influence on the interpretation of its subject. Geography teaching must not confine itself to a catalogue of events. Description and observation demand intelligent appraisal and any account however factual, may contain an element of personal bias. This the teacher will give, or avoid, according to his inclination and his conception of his task. The same is true of film, with the added urgency that it can be a very much more powerful agent in stimulating ideas, encouraging beliefs, and generally manipulating the suggestible minds of the children who see them.

This creative or interpretative use of film is a peculiarly British development. Some years ago, the Grierson-Hardy-Rotha school of film makers established the tradition that documentary films should not be entirely factual, but in Grierson's own now famous phrase, that they should represent : ". . . the *creative* treatment of actuality. What I mean by that is that actual events have been taken and analysed from the creative point of view and given some angle, some narrative form, some dramatic meaning. It is not a discursive description of events but a creative one."[1]

The result of this has been some very magnificent films, those documentary classics such as *Drifters*, *Night Mail*, *The Song of Ceylon*, *Cyprus is an Island* which have set aesthetic and technical and creative standards which subsequent documentaries have on the whole, tried hard to maintain. This is an admirable conception so long as the documentary director realises the power of the weapon he wields. A film objectively conceived tells the truth, but it can never tell the whole truth, for the camera must necessarily be selective, and when in addition the director of the film deliberately sets himself to apply his own "angle" to the film, he must move with care. For by selecting certain facts and ignoring others, by the arrangement of the sequence, by skilful editing, so does he influence the message which the film has to convey. Thus while accepting the view that a factual film should be something more than a flat recital of events, it is well to remember that the distinction between creative interpretation and importunate propaganda may be at times extremely slender. Therefore teachers who choose documentary films for use in schools would do well to examine their subjects and establish beforehand how far the film is an objective statement of fact, how far it reveals an honest personal interpretation, or whether on the other hand its argument is deliberately meretricious and designed to mislead. They should remember also that adults are equipped to appraise the films they see and to distinguish between the true and the false, and in any case the responsibility is their own. Children however are imperfectly informed, their judgments as yet immature, and for these reasons are much more open to suggestion which the film is well able to impart.

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[1] Forsyth Hardy, *Grierson on Documentary*.

TYPES OF FILMS

There are several sources of films of the documentary or the semi-documentary type.

First there are the classics, the work of Grierson, Hardy, Wright, Rotha, Baxter. For the Empire Marketing Board in the 1930's, later for the G.P.O. and finally for the Crown Film Unit, now unhappily no more, they produced excellent films on contemporary topics. Although these were not originally intended for schools it is as well to remember that they have been so used. Indeed these leaders of what we might call the " documentary school " have always been alive to the educational significance of the work they were doing. Thus Paul Rotha : " As well as being a direct teaching aid the cinema is a most fitting instrument for bringing about enlightenment in the child's mind. That is why I personally place a higher value on the so called general illustration film (documentary) than on the direct teaching or instructional film."[1]

Documentary films have hitherto been available free from the Central Film Library, and include some very beautiful films, notably *Cyprus is an Island*, *The Song of Ceylon* ; or *The Pattern of Britain* series, each dealing with a characteristic region of the British Isles, describing its features and the life and work of the people who live in it. *The Fenlands*, *The Grassy Shires*, *The Cornish Village*, *The Crofters* are admirable pictures conveying the characteristic atmosphere of the regions they represent, and give excellent material for a geographical background. These are but a few of many similar titles now available on hire.

Another very prolific source comes from films sponsored by many bodies, commercial firms, travel agencies, the Colonial Office, the offices of the various High Commissioners and others.[1] There are a great many of them and selection must be done with some care for it is difficult to judge the educational quality of a film from its title, and they are not always of very much geographical significance.

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[1] Paul Rotha, *Documentary Film*.

Thirdly, there are the films made specifically for use in school by commercial producers now largely with the close co-operation of the Educational Foundation for Visual Aids. Commercial producers have been making films for school use in limited numbers as far back as 1907, but they were not always very suitable being either too long or too abtruse or lacking the principles of good instruction. The reason was a certain abscence of liaison between the producers and education authorities. Producers were reluctant to make films until a market for them was assured. Education authorities were reluctant to buy until they were sure of getting what they wanted and indeed, until they knew what they wanted, for the value of film as a medium was by no means established. Immediately after the second war the National Committee for Visual Aids, and the Educational Foundation for Visual Aids[2] were established specifically for the purpose of promoting the use and supply of visual material in schools. They work closely with the commercial producers, provide educational advisers for films as they are made, and facilitate supply to Local Education Authorities. As a result there are now available some excellent films made with the requirements of the teachers in mind and graded for the age of the children who are likely to use them. *The Earth and its Peoples* series with titles : *Eskimo Hunter*, *Horsemen of the Pampas*, *Farmer-Fisherman*, is a good example.[3] In each case the intention is to give a coherent and a reasonably comprehensive picture of the way of life of a people and of the country they live in, presenting the essentially geographical character of such a picture by emphasising the close relationship between the lives of the people and their surroundings. This has been done before, but so often in a detached academic sort of way. In this case the director has managed not only to describe the external superficialities which anyone may see, but also to convey the more intimate human qualities, the things that really matter in a way which has the authentic ring about it. Nor is it forgotten that the picture is presented to children. Therefore children play a prominent part in these films, thus setting at once an appropriate level for school use.

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[1] See Appendix 4.

[2] See : *General Information for Teachers and Local Education Authorities*, published by the National Committee for Visual Aids.

[3] The full list now comprises some forty titles.

THE USE OF BACKGROUND FILM

The use of background films is not quite so evident as the short instructional films which fit conveniently into a lesson. A background film is usually longer, and if it is to be worth while it should probably remain so. It is quite legitimate to devote a lesson period on exceptional occasions to the showing of a film which will summarise the content of a series of lessons previously given, or prepare the way for a series yet to come. When this is done it is important that the film should be handled in an imaginative and intelligent fashion. A single unprepared screening with the flat injunction at the end of it to " Write an account of . . ." is an unenterprising and pedestrian treatment. It goes without saying that the film should be well known to the teacher before it is shown to the class. Before screening, the class should be given a brief account of the content and of its relevance to work already covered and a special mention made of points to notice with an approximate idea as to when they are due to appear in the sequence, otherwise they may be missed. This preliminary preparation should be very brief, and quite objective. Opinions and appraisals should be left until later so that the film may be given a chance to tell its own story without prejudice. Subsequently it can be discussed, or left to make its own impact. I am sure that the enjoyment, and with it the educational benefit of many a film is destroyed by an obstinate insistence on what is termed " follow-up ". Children are harried to recall facts, or to disclose reactions which they may or may not feel, and which in any case they are probably reluctant to reveal. These things do not always represent a true measure of the worth or the depth of the experience which they have just undergone. Is it too much to assume that there may be occasions when the most imaginative treatment of a sensitive film, may be to allow it to make its own impression through the pleasure it affords, the atmosphere it creates and the depth of the emotional feelings which it evokes? Many a background film can do these things extremely well, and it seems a pity always to analyse it down to its minutest detail, to strip it bare and examine it. Therefore I suggest that we might treat this matter of "follow-up" with some caution; that we might set a little less store by the facts which are recalled and rather more by the stimulus which the film provides, and which is not always revealed. Very evidently the precise treatment will vary with the nature of the film. In some the factual matter is dominant and may be legitimately examined. In many others the more appropriate treatment is to appraise its subtler qualities, or to examine its fidelity to its subject. Children soon become aware of the finer points of film for they are sophisticated viewers, and with training they will become more articulate in expressing themselves.

When such films fit conveniently into a syllabus and when class time permits a lesson may be given to viewing of this kind. But time for formal work is short, and when children of parallel classes can conveniently view together, it is possible to show documentary film at special sessions either within, or outside the timetable. If the first purpose of a background film is to create "atmosphere" it is better to shut out the school and its surroundings altogether and to project in the traditional fashion in darkness, so that the viewer submits to the hypnotic effect of the brilliantly illuminated screen. In the case of a film dealing with the way of life of a foreign people, we must live *with* these people, to absorb their feelings and enter into their life if the full benefit of the film is to be felt, and this cannot be done so easily in daylight when distractions and unwanted interruptions from outside constantly destroy the illusion.

OTHER ASPECTS OF FILM VIEWING

There are one or two other points concerning the use of film which deserve some notice:

(i) *Still Picture.* I can see little virtue in the practice of holding stills from a moving film upon the screen. It seems to me that the essential quality of a film is that it moves. If the film stops, the continuity is lost, and the whole purpose for which it was made ceases to exist. It is surely better to see the film in its entirety without interruption, and then to use the strip projector for still pictures if necessary. The practice is recognised by certain film producers who make instructional films available together with filmstrips composed of selected frames from the film.

(ii) *Sound.* Happily we rarely get nowadays those distracting bursts of exuberance known popularly as " background music ". Many a good film has been ruined in this fashion, in the mistaken notion that a little light relief aids the process of learning. The same applies to the semi-jocular commentaries from well meaning commentators, once a feature of early educational films. Where the art of the film is enhanced by, or even dependent upon the combined use of visuals and sound, then obviously sound is quite proper. An outstanding instance is to be found in " Scott of the Antarctic " where Vaughan Williams has caught precisely the dramatic quality of the film in his score. The film would be immeasurably weakened without it. Documentaries sometimes use sound in this fashion, but more usually, they employ natural sound to support the impression of reality. The difficulty arises when there ought to be a commentary also, for the two cannot compete. They may be used alternately quite effectively and this is often done. But when commentary alone is used, it is a question whether it should come from the sound track, or from the teacher, speaking to a silent film. We must remember that the commentary must be perfectly timed. It must coincide exactly with the appropriate shot, for to be even a fraction of a second late will ruin the effect. At other times it must anticipate the visuals, and allow time for assimilation. All this requires extreme skill, as well as the most intimate knowledge of the film, and on the whole I am inclined to believe that it can be done better by the professional commentator, and with much experiment in the processing laboratory, than by the teacher. The separate commentary and the silent film tend to divide attention whereas it should in fact be concentrated in a single experience.

There are other arguments, as for instance, that the teacher's voice is known to the class and that he can vary his comments to suit the intellectual capacity of the children. There is some force in this last point although it is not often that the same film will be used for groups of children who differ widely in their capacity to profit by it. As to the first point, one of the reasons why film is used is that it provides an element of variety and a stimulus from outside the classroom. This might well be extended to include another voice as a change from the one to which the children are so accustomed.

4. MODELS

It is said that illustration should be given in this order of preference:

1. An actual object.
2. A model of it.
3. A picture of it.
4. A diagram of it.
5. A verbal description.

This is not always true. An "object"—a complicated landscape for example—can be very confusing and a picture of it even more so. Even a model is not always so clear as a simple diagram. Nevertheless modelling does serve a useful purpose in geography teaching. A simple model made by the children themselves is often more educative than an elaborate one made at great pains by the teacher. Its value depends less upon its intrinsic quality or the time taken to make it, than upon the intimate study and the discipline that must go into the making.

Models in geography are principally of two kinds:

(i) Landscape and relief models.

(ii) Those which refer to other aspects of geography, chiefly the mathematical.

(I) LANDSCAPE AND RELIEF MODELS

Landscape can be represented for younger children in the most simple manner. Egg shells turned upside down upon a base of cotton wool give a very fair imitation of the Eskimo scene. Green dyed sawdust sprinkled in a tray with palms and huts in cut paper make the African village. A sheet of hessian supported in places from below makes a rough relief which can be painted as desired and adorned with model buildings, bridges, trees, hedgerows, roads, railways and rivers. Tapes, strings, pipe-cleaners, shredded cotton wool and similar materials are very useful for this purpose.[1] These devices can be very realistic. Children with their lively imagination and love of fantasy are as a rule only too ready to accept them for what they are—imaginative substitutes for the real thing. However, a teacher of very young children must be alive to the danger lurking in the background, that the children in their limited experience may take them too literally and so form the impression that Africans spend their time in paper huts and that Eskimos live under inverted eggshells.

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[1] See Bayley, *The Craft of Model Making*. Evans & Udale, *Illustrative Model Making*.

For older children models made to illustrate landscapes or certain features taken out of the landscape (such as a spur, or a re-entrant, a young valley, river-terraces, an escarpment or dip-slope) are very much more instructive and far more stimulating if they represent actual examples taken from a living landscape and not hypothetical examples manufactured by the teacher. Reality is so very important in every branch of geography teaching, and particularly in this case. It is so easy to make models merely for the sake of making them, and to become more absorbed in the models themselves than in what they teach. To enhance the impression of reality the model surface should be finished to represent as nearly as possible the true surface, and the vertical scale should be kept down to the minimum. Very often this is much over-exaggerated, giving an Alpine appearance to a region of most modest undulations, so spoiling the appearance and the teaching quality of the model.

Types of Models. The simplest of all is a sand tray, where landscapes are easily moulded by the children in firm, moist, fine sand.

Models designed to teach contouring are best done by layering. From a map of the landscape, contours are traced at chosen intervals and transferred to thick card, manilla paper, straw board, or plywood according to the strength and thickness of the material required. The layers are cut out and placed on top of each other as in Fig. 70, and glued under pressure. The joints between the layers then represent the contours. The layers themselves can be coloured in the conventional shades used for representing relief and the completed model appears rather like a relief map in depth.

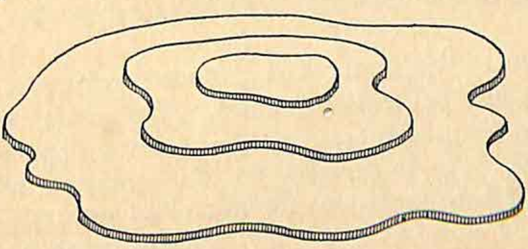

FIG. 70

The stepped effect at the contours is not disturbing so long as the steps are not too steep, which means that the material must not be too thick. Plywood of $\frac{1}{8}$ inch thickness, or strawboard of $\frac{1}{10}$ inch usually make steps that are too steep if the area is small and heavily contoured. Strawboard of $\frac{1}{20}$ inch or $\frac{1}{35}$ inch thickness or even thin white card will give a very adequate impression of height in a small model.

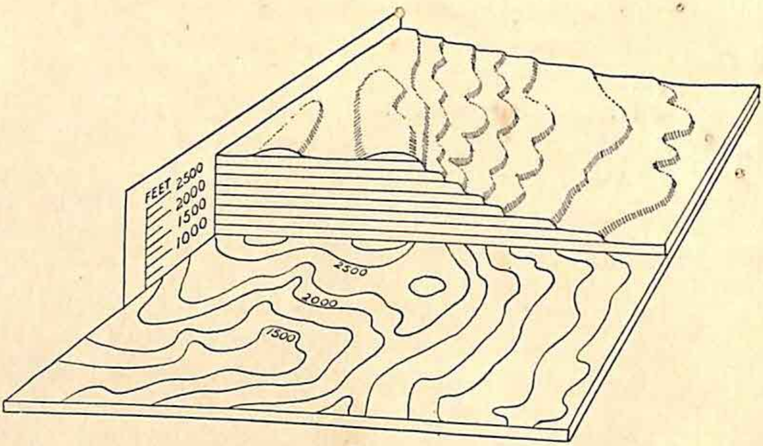

FIG. 71

The intervals chosen for tracing must depend on the nature of the ground. In an area of low relief it may be possible to take each 100 feet contour. If the area is mountainous then it may be better to choose every 250 feet or more. The selection must vary with each case, the principle being to maintain a decent proportion of height to area and to avoid excessive exaggeration. Surface colouring and surface features in this type of model should retain the character of the map with layer colouring and symbolic representation of features, for it is not a landscape model at all in the normal sense of the term. It is rather a relief " map " in three dimensions.

A variation of this method of contour teaching is to build up half the area in relief in this manner, while for the other half the contour lines from each layer are drawn on flat paper in the form of a map (Fig. 71). In this way the close connection between the contour line of the map, and the joints between the layers of the model is brought out very clearly. It is as it were, a static version of the device used in animation in the moving film. (See page 210)

It is possible to relieve the sharpness of the " cliff " effect at the join of each layer by smoothing over the whole with a mixture of plastic wood. This dries quickly and shrinks a little in doing so, leaving the edges of the layers still discernible as contours. The roughness of plastic wood can be smoothed off with fine sandpaper, and it is advisable to do the filling in small sections as it dries very quickly and is soon difficult to work.

There is another type of model much used for contour work. In this case the contours are drawn boldly on to separate sheets of glass in indian ink. The layers are then placed on top of one another and enclosed in a wooden framework. By looking at the model from above, one has the impression of seeing the land features stereoscopically. It is quite effective but very fragile, and can only be done for very small models. It is of course, a variant of the layer method but in glass instead of wood or card. From its nature it is not so suited to vigorous work by children. To be really effective it has to be seen from directly overhead, consequently its value is very much less than that of the models which children can make for themselves in more robust material.

Landscape models designed primarily to show landscape features and not contours, should depart from the formality of the map and approach as nearly as they can, the reality of the landscape which they are designed to represent. Thus the steps between the contour layers are out of place in this type of model. The slopes should be smooth, the colouring should approach the natural colouring of downland or heathland, bare outcrops, cultivation or woods. Artificial features—roads, railways, the line of a hedgerow should be included to add to the reality of the finished model. The amount of such detail depends on the size and scale but there can always be sufficient indication of the true surface instead of a uniform colour, sufficient at least to make the difference between a landscape with its own life and character[1] and a model which remains just a specimen.

There are three principal methods which can be used for making the foundation of models of this kind.

(i) In the first place there is the layer-method as used for contoured models. The layers are cut out and placed on top of each other as before, and then covered over with a suitable substance to hide the joints and to give a smooth finish. If the area is a large one, the thickness of the material may be insufficient for the vertical interval, in which case the height may be increased by mounting the layers on pegs, as in Fig. 72. The edges and the surface of the material are covered over, and the inside left hollow supported by the pegs. In a large model this has the advantage of reducing weight.

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[1] See for example, the magnificent models in Dudley Stamp's *Earth's Crust.*

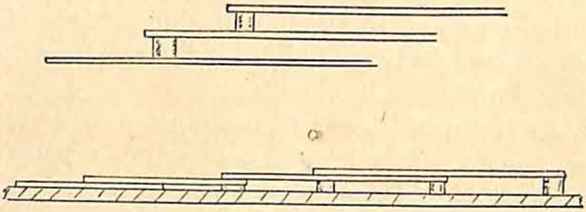

FIG. 72

(ii) Secondly, the foundation can be built up by means of several sections taken across the map. These are then erected on a base at the appropriate intervals, as in Fig. 73. The edges are secured in the sides of the framework to give additional stability. The spaces in between are then filled in with a suitable substance which is smoothed off to the height of the sections. The method is rather laborious especially when the area is heavily contoured. This is of small significance however, for any model making involves time and trouble. The best way to reduce the labour, and the most educative for the children themselves, is to divide up the work among many children, or groups of children.

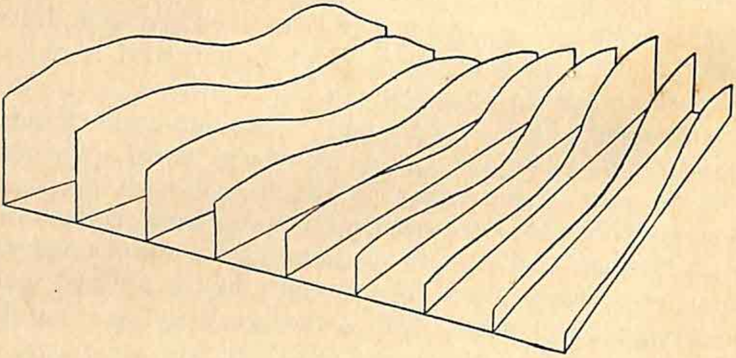

FIG. 73

(iii) A third method somewhat similar to the section-strip method is to make a rough tracing of some of the principal contours on a base. Spot heights are marked in. Pegs are then cut to various lengths proportional to these heights, and they are stuck on to the base at the appropriate points. Filling in is then done as before, but in this case, to the tops of the pegs. This method is probably rather less accurate than either of the other two (Fig. 74).

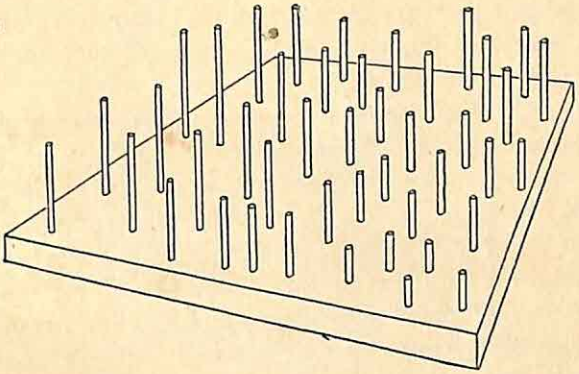

FIG. 74

Filling Substances. Each of the methods described above gives a skeleton on which the final model is built up. The success of it depends very largely on the " suitable substance " used for filling and surfacing. There are several but none of them is perfect for amateur use. Weight is one of the principal difficulties. Large models with a considerable amount of filling become very heavy indeed although the substances may be lightened by adding sawdust or shredded cotton wool in the lower layers. The tendency to crack is another drawback. Since most of these substances are mixed with water, they are liable to shrink as they dry out and cracks develop which spoil the appearance of a model.

Paper-pulp is a cheap, useful filling. It is made by tearing up old newspaper into small pieces, boiled for a considerable time with a pinch of caustic potash to assist the pulping. It should be pounded into a paste, and boiled again in glue or size or mixed with plaster of paris.

Flour-paste is the base of another composition the ingredients in this case being shredded cotton wool, tepid flour paste, stirred and thickened with ordinary whiting. There must be some experiment with the proportions of these substances to get a suitable consistency; approximate quantities are a cupful of flour paste to a handful of cotton wool, thickened with whiting until it resembles putty and until it is easy to work. It is sometimes easier to allow it to set for a while before working. It can be mixed the night before it is to be used and covered with a damp cloth. A pinch of alum added to the mixture will prevent it from going bad.

Pyruma, *Alabastine*, *Plaster of Paris*, and similar substances can also be used but they are rather costly. Plaster of Paris, particularly, sets very quickly, gives a smooth, hard surface, and is less liable to crack or shrink.

Modelling Clay[1] of the type known as *Plastone* is very effective and sets hard. The M. 6 Grey Powder Modelling Clay is also suitable for the purpose, but does not set so hard. *Plasticine*[2] does not shrink, or twist, or crack, nor does it cause a strawboard foundation to swell. It can be worked quite easily, and softens with the addition of a little vaseline. *Plastic Wood* is suitable for small models. It shrinks slightly as it dries, has a rough surface, and becomes tacky very quickly, making it difficult to work. It is not primarily designed as a modelling substance.

Any of these mentioned will give a very satisfactory finish. For really accurate work with meticulous detail and a professional finish, there is little doubt that plaster of paris taken from a cast is quite the best, for surface detail can be added after the mould has been taken.[3]

For rough work a good result can be obtained by first building up the model with section-strips cut in plywood and covering these with a sheet of hessian pulled down tightly over the irregularities of the sections, padded underneath with shredded felt or cotton wool to mask the sharp corners. The hessian is tacked in position and brushed over with a thick mixture of plaster to fill the grain or simply painted with thick poster paint. A model made in this way is not particularly accurate. It is rather fragile and the surface is inclined to flake, but it has the merit of being light, cheap, quickly made and far less messy than the various media mentioned above.

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[1] By Messrs. Dryad of Leicester.

[2] By Messrs. Harbutt of Bath.

[3] For details of plaster casts see Bayley, *The Craft of Model Making*, Chapter IV. Also, in *Geography*, Vol. 28, Pt. 1, T. W. Birch describes various methods of making geographical models.

(II) OTHER MODELS

These are principally concerned with the movement of the earth and the various problems that arise from it. Latitude and longitude, the seasons, the altitude of the sun and its apparent path in the sky are examples of teaching subjects which may benefit from the use of three dimensional models.

In *Latitude and Longitude*, for example, an explanation of how the lines are obtained can be very much more easily given if we can actually get at the physical centre of the globe and measure angles from that point. This cannot easily be done with an ordinary globe, therefore a model of some kind must be made to represent it. A *solid wooden sphere* can be turned on the lathe in two separate halves (Fig. 75). On the plane surface revealed when it is opened out, angles are measured from the centre, both north or south of the equator, and parallels are drawn round the spherical surface when the two halves are closed again. Similarly, a slice cut off the top reveals a plane surface for the measurement of angles east or west of the meridian of Greenwich.

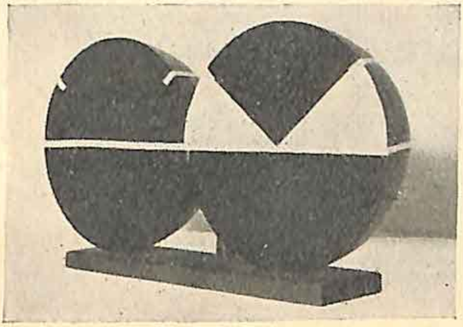

FIG. 75

Another method is to build a model in wire, or in plywood as in Fig. 76, where the plywood surfaces represent the equator, the meridian of Greenwich, and the latitude and longitude of a chosen place. This model shows quite clearly that the measurement of

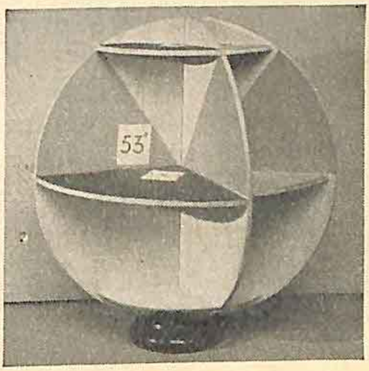

FIG. 76

angles is done from the centre, but it is not easy to construct accurately. On the other hand it loses a lot of its point unless the children make their own and measure the angles themselves.

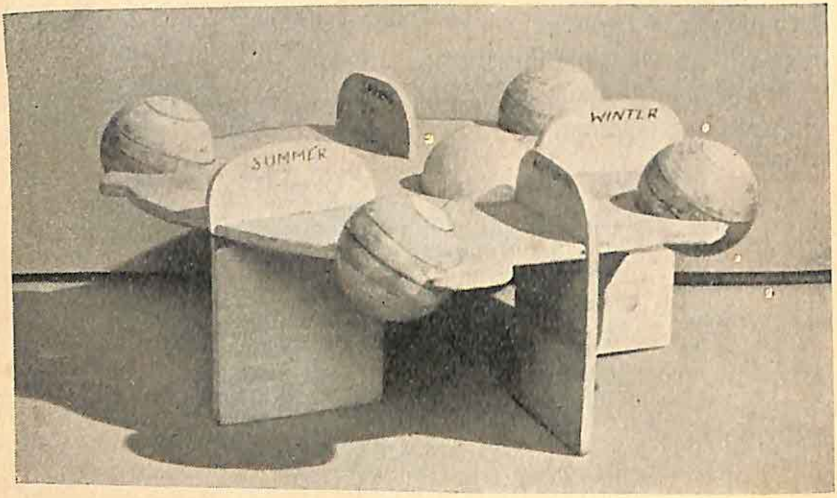

FIG. 77

The Seasons can be demonstrated by means of a static tellurion as in Fig. 77. Relative size and distance must be ignored when the model is made. In this case, the earth is represented by ping-pong balls. An orrery[1] or working tellurion is an ingenious construction which can easily be made out of meccano parts, a rubber ball, and a table lamp (Fig. 78). A toothed wheel at the end of the long arm is pressed into the table-top as the earth pursues its course, and this rotates the ball upon its spindle. The lamp in the holder is 100 W. and it illuminates one half of the sphere quite adequately. The equator, the tropics, the Arctic and Antarctic circles are marked in chalk upon the black surface of the sphere.

The sun-arc can be constructed to illustrate the apparent path of the sun in the sky. Fig. 79 is such a model, cut in ply-wood. The horizontal circle represents the observer's horizon. When the middle circle of the three is set to the required latitude (marked on the vertical ring), the three circles together then show the sun's path in the sky for the summer solstice, the equinoxes, and the winter solstice respectively. That part of each circle which is above the horizon represents day, and the part below the horizon

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[1] So called after Charles Boyle, 4th Earl of Orrery, 1676-1731.

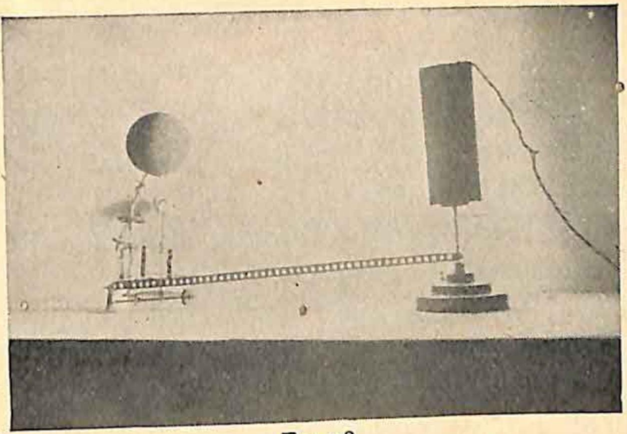

FIG. 78

represents night, in each case. The times of sunrise and sunset are marked on the horizon.

Each of these models, has the purpose of elaborating the diagrams of the blackboard. Their real value is that in the making of them, very close attention has to be given to the principles which they illustrate ; therefore they must be made by the children themselves to fix firmly the ideas that they have learned. They are not really

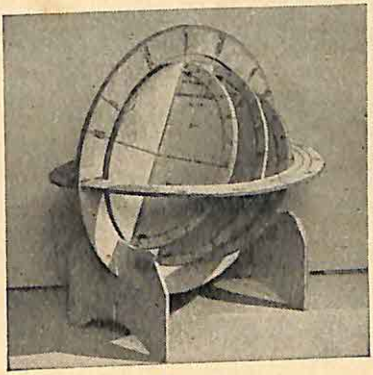

FIG. 79

teaching models at all. For one thing they are far too small for class demonstration and further, children learn best from them when they have the chance to handle them at leisure. But one must be careful not to become " gadget-minded " and to give to the models an undue prominence which they do not deserve. It is then fatally easy to become more absorbed in the models themselves than in the principles which they are intended to illustrate.

BIBLIOGRAPHY

J. Adams, *Exposition and Illustration in Teaching*, Macmillan, 1929.

Scottish Educational Advisory Council, *Visual and Aural Aids in Teaching*, H.M.S.O., 1950.

W. L. Sumner, *Visual Methods in Education*, Blackwell, 1951.

M. D. Vernon, *Visual Perception*, C.U.P., 1937.

M. D. Vernon, *Further Studies in Visual Perception*, Kegan Paul, 1952.

G. J. Cons, *Geography and Visual Education*, R.G.S.

E. Dale, *Audio-Visual Methods in Teaching*, Harrap, 1947.

C. Beale, *Look and See*, Kingsgate, 1949.

R. W. Perry, *Blackboard Illustration*, Manual Arts Press, 1945.

W. D. Seymour, *Improving the Blackboard*, National Institute of Industrial Psychology.

W. J. Watkins and H. S. Watkins, *How to look at Geographical Pictures*, Macmillan, 1949.

F. J. Monkhouse and H. R. Wilkinson, *Maps and Diagrams*, Methuen, 1952.

E. M. Sanders, *Geography From the Air*, Nelson, 1951.

British Film Institute, *Geography Teaching Films*, B.F.I., 1948.

National Committee for Visual Aids, *The Making of Geography Teaching Films*, National Committee, 1950.

A. Buchanan, *The Film in Education*, Phoenix Press, 1952.

M. K. Kidd and C. W. Long, *Filmstrip and Slide Projection*, Focal Press, 1949.

C. D. Milner, *Making Slides and Filmstrips*, Focal Press, 1953.

T. L. Green, *Making and Using Filmstrips*, Pitman, 1952.

P. Rotha, *Documentary Film*, Faber, 1934.

F. Hardy, *Grierson on Documentary*, Collins, 1946.

T. Bayley, *The Craft of Model Making*, Dryad, 1950.

L. Evans and J. T. Udale, *Illustrative Model Making*, Longmans, 1947.

E. J. Barker, *Modelling Geography*, Ginn, 1954.

W. G. Balchin and A. W. Richards, *Practical and Experimental Geography*, Methuen, 1952.

Dudley Stamp, *The Earth's Crust*, Harrap, 1951.

H. Goodall, *The Globe and its Use*, Philip, 1936.

ARTICLES IN *Geography*

J. A. McMichael, A Method of Modelling in Relief, Vol. 5, 1909.

A. H. Spary, Methods of Geographical Model Constructing, Vol. 7, 1913.

N. Catty, The Value of Modelling in the Early Teaching of Geography, Vol. 9, 1917.

D. L. Linton, The Use of Air Photographs in the Teaching of Geography Vol. 31, 1946.

R. R. Rawson and S. H. Beaver, Aerial Photographs and Geographical Studies, Vol. 32, 1947.

C. M. Howe, A Note on the Application of Aerial Photographs, Vol. 36, 1952.

M. Long, Children's Reactions to Geographical Pictures, Vol. 38, 1953.

H. C. Prudden, Blackboard Outline Maps, Vol. 38, 1953.

ARTICLE IN *The Geographical Journal*

J. K. St. Joseph, Air Photographs and Archaeology, Vol. 105, 1945.

ARTICLES IN *Visual Education*

B. R. Winstanley, The School Museum Service, July, 1950.

E. A. Crick, The Teaching Film, September, 1951.

D. Walters, Designing an Educational Wall Chart, February, 1952.

G. S. Campbell, Using Posters in the Geography Lesson, April, 1952.

A. Leonard, Research in Visual Perception, November, 1952, to January, 1953.

M. D. Vernon, The Use of Diagrams, February, 1953.

B. Morris, Research in Visual Education, August, 1953.

M. Long, Looking at Geographical Photographs, November, 1953.

W. J. Earl, The Function of Visual Aids in the Teaching of Geography, November, 1954.

P. R. Heaton, Air Photographs as a Visual Aid, December, 1954.

M. Simpson, The Drama of the Weather, January, 1955.

F. A. Ring, Compiling a Filmstrip Catalogue, January, 1955.

A. Vincent, Preparing and Storing Visual Material, March to June, 1955.

G.T.G.

ARTICLES IN *Film User*

G. H. Gopsill, Operation and Maintenance of Projection Apparatus, January, 1952.

British Kinematograph Society, Good 16 mm. Presentation, December, 1954 to February, 1955.

G. H. Gopsill, Teaching With Film, April to September, 1954.

A. L. Stampa, How Children See Pictures, February, 1955.

In each of these journals except the Geographical Journal, there is also a record and appraisal of new releases of films and filmstrips.

CHAPTER 9

SCHOOL BROADCASTING

> The sheer accessibility of the broadcasting services are their chief source of power. The machine which can give household hints to the housewife can also mould the minds of a nation.
>
> ROGER MANVELL

SCHOOL broadcasting cannot be considered without a reference to the general broadcasting service. They are in a sense related, because the attitudes and ideas which children get from the one are necessarily reflected in their attitude to the other. General broadcasting is one of the "mass media" as Unesco is pleased to call them, the others being commercial cinema and the popular press. Each of them is relatively new. Universal circulation of the newspapers does not go back beyond the beginning of this century; the cinema has a popular history of some forty years, and the radio has been extensively used for about twenty-five years. In this short time technical improvement in all these services has increased their range and their power, so that they speak ever more convincingly to an audience which constantly expands. It is very probable that this technical efficiency has developed more rapidly than the critical ability of the public who make use of it. One of the principal dangers of mass methods of communication lies in surrendering to them the intellectual initiative and this invites complacency in eventually accepting the standards they have to offer.

Outside school, children are caught up in this situation and their habits of reading, viewing, and listening are largely conditioned by the customs of those around them.

Elsewhere in this book I have suggested that a part of the task of education is to teach children to look more critically upon the popular press and the commercial cinema. Very much the same applies to the use of radio in schools. If children are taught to use broadcasts intelligently, there is the possibility that subsequently their attitude towards the public service may be more discriminating.

School Broadcasts

The broadcast service to schools began in 1924 in a very informal and improvised fashion. The first organisation for an extensive service came in 1927 when the Central Council for School Broadcasting was established to make contact with teachers through a series of programme sub-committees. This body was reconstituted in 1947 with the title of the The School Broadcasting Council.[1]

BROADCASTS FOR THE TEACHING OF GEOGRAPHY

Before considering what distinctive contribution broadcasting can make to the teaching of geography, it is well to clear the ground by noticing what broadcasting *cannot* do.

It does *not* provide a teacher with a set of prefabricated lessons which he can then fit into his year's scheme. Comments from teachers sometimes reveal a trace of disappointment because a broadcast is insufficiently geographical or omits fundamental facts. Perhaps a series of successive broadcasts does not appear sufficiently coherent or concentrates too much upon places of lesser importance. The implication in these criticisms is that the individual broadcasts were not sufficiently like *lessons*, nor did the series follow the lines of a systematic syllabus.

However, this is not the intention of the School Broadcasting Council, not through any lack of respect for what the schools might wish, but because it would be quite impossible to pursue such a policy. There are two reasons for this :

(1) The needs of individual schools vary so widely, that no central broadcasting service could possibly meet the requirements of them all in terms of specific lessons. During 1950 the Council conducted a very thorough survey[2] into the needs of the schools and noticed the wide differences which existed in the arrangements for the teaching of geography. Different teachers pursue the same aim in different ways ; indeed their aims are not always identical. This is quite as it should be, for an inflexible method stereotyped by convention, or a single aim imposed by direction is quite foreign to the spirit and purpose of education in this country.

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[1] For details of the development of School Broadcasting, see Palmer, *School Broadcasting in Britain.*

[2] See *Geography and School Broadcasting,* published by the School Broadcasting Council for the United Kingdom.

(2) Secondly, the medium of radio is not suitable for conducting a lesson. In Chapter 5, I have mentioned that the dominant feature in a successful lesson is the personality of the teacher who directs it. He has many aids to assist him but more important than all of them is the stimulus that he imparts to his class through his own presence. This is missing in a broadcast, hence, it cannot possess the character of a lesson as it is understood here. The term " broadcast lesson " is not strictly a true one.

With this in mind, we can now look at the positive qualities of broadcasting. It is essentially an illustration of a peculiar sort. Word pictures in certain circumstances are no less revealing than visual pictures provided that they are delivered with skill and ring true. Broadcasting does this very well. Persons with exceptional experiences, natives of foreign lands, travellers who can bring to life the countries which they have visited, all speak direct to children and their words have the force of authority. From these accounts emerge unusual details which are not normally found in the textbooks. As a rule the information is thoroughly up-to-date, which is a matter of first importance in geography. Sometimes this is vital, as in the case of an eye-witness description.

In addition to these straight talks the resources of broadcasting bring in other illustrative devices. Where a scene involves more than one person it can be dramatised or effectively presented in the form of an interview between the traveller and various local personalities. This brings out subtle changes of character which might not be apparent in a recorded talk. Moreover, it prevents the broadcast from being spoiled for children if the traveller is not very adept at the microphone.

In addition, local music or other sounds appropriate for the occasion can be introduced. Productions of this kind are skilfully done in school broadcasts, and they help to create an atmosphere of realism which brings a scene right into the classroom.

These programmes provide a change from other methods, and change is always welcome. They also gratify the children's age-old liking for hearing a story. For the younger children particularly, (and the faculty is by no means lost as they advance into adolescence,) story-telling still remains popular in spite of more sophisticated modern methods. Stories by radio have the additional advantage of being able to call upon the services of highly skilled narrators as well as a variety of techniques beyond the reach of the layman.

The Two Geography Broadcasts available are "Travel Talks" for Primary schools and "Geography" for Secondary schools, principally for children of 11-14 years.

The general principles discussed above apply to both of them, but there are certain minor points of emphasis suitable for the age groups to which they are addressed.

Since the younger children take delight in exciting events and stirring deeds, "Travel Talks" concentrate rather more upon the travels of interesting personalities and the background of the countries they visit is incidental. Children of this age frequently take refuge in fantasy, and here they have ample opportunity to immerse themselves in a life which is much more exciting than their own. "Travel Talks" do not usually present a series of broadcasts around a central theme, although a tenuous link has sometimes been provided between individual broadcasts in the form of "Ports of Call" on a shipping route, or an invitation to "Come and Visit Us", from children in other lands. This gives a certain continuity for those who wish to take the whole series, but it does not prevent each separate broadcast from being self-contained. Systematic regional work is not characteristic of Primary school geography, so the intention here is to roam widely and present a very varied picture of life in different places. Thus in the same term there may be episodes as widely different as "Life on an Argentine Estancia", "On an Australian Sheep-Station", "Vesuvius", "Village Life in Southern Spain", "Beside the Nile", and "Farming the Veld in South Africa".

In "Geography" on the other hand, there is more regard for sequence, so that a teacher can if he wishes, use successive broadcasts to illustrate sample studies within the same region. At present the regional arrangement is organised on a four-year cycle. A complete series may cover "Life and Work in Western Europe" or "Life and Work in the Americas". Individual broadcasts are so arranged that they may be taken independently of each other, or together. The programme chosen depends largely upon the contributors available at any one time, or upon a bias towards some specific aspect of the geography of the area. Also the choice is sometimes made deliberately to include the lesser known localities which do not always figure prominently in other sources. There is a certain originality about this which underlines the general policy of providing material supplementary to that which the teacher can get for himself.

In general, " Geography " tends to be more factual and more comprehensive in its treatment of topics than the " Travel Talks ".

USING THE BROADCASTS

The School Broadcasting Council issue a series of publications to help the teacher make the best use of the broadcasts. In June of each year, the Annual Programme is published for the following school year, giving the titles and times of each series. Notes for the teacher appear at the beginning of the term to give him some idea of the ground which each broadcast will cover. Teachers have frequently asked that these notes should be much more specific in detail, to the extent of offering a synopsis of each talk. It is generally conceded that this would be a great help, but the producers find themselves quite unable to do this at the time when the pamphlets must go to press. Although the *title* of each programme may be known, the contributors have very rarely revealed the details of their talk by this time. They may not even be in this country, so the programme producers are themselves not sufficiently informed to be able to supply a synopsis at this stage.

Pupils' Pamphlets are also published, consisting chiefly of illustrations which have some bearing on the broadcasts, together with a map of the area dealt with by the series.

A class must be properly prepared immediately before listening. This is merely an application of the psychological principle of conditioning the listeners so that they are mentally " set " for the subject that is about to come. In his personal teaching, a teacher always manipulates the minds of the children in the introduction to his lesson, making them receptive for the main part of his exposition. In a broadcast, this exposition begins straightaway when the knob is turned and the children may be left very much in the dark unless they have some knowledge of what they are about to hear. In preparation the teacher should not try to anticipate the broadcast by giving his own description of the same topic. For one thing he does not know precisely what form the broadcast will take, and further, this practice really amounts to an attempt to do the same job twice over.

The object of preparation is simply to set the stage in a straightforward factual manner, to locate the country and the region within it, to note any physical or other features which might help in understanding, or names of places which might be mentioned. If these things are mapped very quickly, together with a scrutiny of the relevant illustrations in the accompanying pamphlet, the children then have a mental background with which to work. Broadcasting is essentially an aural technique, but children interpret the words they hear principally in the form of visual images, and this translation is helped considerably if some visual assistance is given. Otherwise, the images will be formed largely in terms of the children's own experiences, and much confusion arises when a verbal description of one locality is projected in the child's mind on to a background derived from another which is wholly foreign to it. The absence of a visual element in broadcasting is sometimes regarded as a serious drawback for geography teaching. But it is always possible to provide an appropriate setting from another source (for example, from the pictures in the pamphlets) and still to make use of the unique qualities which broadcasting has to offer.

During a broadcast it is normally regarded as good practice to let children listen undisturbed. Events move quickly and if their attention is diverted to other matters, they soon lose the thread and their interest is gone. Writing notes upon the blackboard, note-taking by the children, looking for place names in the atlas, all tend to be distracting. Some teachers prefer their children to make notes as a check upon the effectiveness of their listening, and it is possible that many of them can be trained to do this quite well. But I believe that in general, this does not come so easily to children. The speed at which they write and the concentration upon the writing, invariably leave large gaps in their listening, and they are not always skilled in picking out the right things. I also hold the opinion that much of the value of a broadcast lies in the emotional appeal which it holds for children. They are taken out of themselves as the scene unfolds, captivated by stirring events or moved by the personality of the speaker, and this deeper, more subjective aspect of listening is spoilt if children are required to do other things at the same time. While listening, they can always jot down an abbreviated note, a word not understood or a point to be raised without loss of continuity, although the teacher is in a very much better position to do this than the children.

Opinions vary widely as to the most satisfactory method of following-up. There is the one view that a broadcast should be left alone to make its own impact. This arises from the belief that its principal virtue lies in the attitude created, which may be destroyed by analysing its factual content afterwards. There is some truth in this, but in any broadcast words will have been used which are not understood, and remote places referred to which have not appeared in the preparation. Allusions may have been made which (until they are explained) are lost upon the children. When these things have been cleared up understanding is more complete without any loss of inspiration.

Follow-up can take the form of a discussion which is largely guided by the teacher's own notes, or questions to clarify those points in need of it.

Later on, these can be taken further in written accounts, visual displays, or projects. Children enjoy keeping records of these broadcasts. Class editors write up the substance of each talk, illustrate it suitably, and bind a whole series together into a folio, making very handsome books which are well worth preserving in the geography library.

Often there are films which deal with the subject of a talk, and well chosen pairs of film and broadcast reinforce each other. The films can be shown after school, or at meetings of the geographical society.

Where these things can be done, there is every reason to believe that radio makes an admirable adjunct to other forms of teaching. Because of the many other claims upon teaching time, it is often difficult to fit in the broadcasting periods. With limited time available for geography, it is not always possible for a school to accept the broadcast when it is offered. The broadcast lasts only for 20 minutes but to use it profitably there ought to be additional opportunity before and after, to prepare and to consolidate. When the broadcast is at 11.20 an ideal arrangement is to hold a geography period between eleven o'clock and noon, but this is asking a great deal in schools where there are only two geography periods in the week. If it is impossible to devote this amount of time, my inclination is to maintain the preparation period at all costs, for it is quite essential that the children should get their bearings and then they are more at their ease while the broadcast is taking place and misunderstandings are likely to be fewer. Immediately afterwards, the teacher can confine himself to only those explanations necessary to prevent the children from departing with gross misconceptions. The various other activities coming under the heading of " follow-up " can be pursued out of school time, like so many other geographical activities.

The choice of region offered in the broadcast series does not necessarily correspond with the arrangements already made in the geography syllabus. It is possible to argue that since this programme follows a four-year cycle and is always announced beforehand, then any teacher who is really anxious to make use of it has plenty of time to plan his syllabus accordingly. Of course this can be done, unless there are other considerations which also exert pressure to shape the syllabus in some other fashion, and since this is usually the case, broadcasting is more often taken purely as an extra experience for the children, without relating it in any way to formal teaching.

In view of these difficulties, I consider that broadcasting would be much more acceptable in schools if the teachers were able to make use of it at times convenient to themselves. Radio is now recognised as an educational force possessing vigour and versatility, but the greatest single deterrent to its more widespread use, lies in the fact that the programmes must be taken at the time stated or not at all. How very much more convenient it would be if recorded versions of these programmes were available for loan or hire in precisely the same way as a reel of film. It is small comfort for teachers to learn that copyright prevents this being done. There should be no insuperable obstacle to such an arrangement, if broadcasting is to give the most comprehensive service to the schools.

TELEVISION BROADCASTS IN SCHOOLS

It is not possible to give any considered opinion on the potential merits of television broadcasting in geography teaching, nor to assess its worth by comparison with other methods. We do not know enough about its possibilities yet. An experiment conducted by the B.B.C. and the School Broadcasting Service in six Middlesex schools during May 1952 has thrown some light upon the matter and enables tentative suggestions to be made. Clearly, it must be borne in mind that it would be both untimely and unfair to the sponsors to make anything more than provisional inferences on the basis of such slender evidence. The conditions of the experiment and the organisation of the programmes were not necessarily typical of what a general school broadcasting service would offer. The purpose was merely to investigate techniques of broadcasting which might be relevant to any future television service.

In geography the broadcasts consisted of programmes entitled " An Alpine Farm ", " A Modern Dairy Farm ", " Cod-Fishing off the Newfoundland Fishing Banks ", and " Maps and Mountains ", and in addition, there were certain programmes in the Current Affairs broadcasts which might be considered geographical, in particular " Men against Volcanoes ".

In these programmes, presentation techniques varied from straightforward " outside broadcasts " to recorded film ; in addition there was a mixing of devices on certain occasions, as when extracts from films were interpolated with other materials, or the televising of studio aids and demonstrations.

If so few programmes can be any guide, the inference at present appears to be that the contribution of television bears a marked resemblance in some respects to that which is now made by radio, namely that those programmes appear to be the most successful which supply the teacher with supplementary illustrative material (as in the case of " A Modern Dairy Farm " or " Cod Fishing off the Newfoundland Fishing Banks ") rather than those which undertake specific teaching, i.e. those which most nearly approximate to formal lessons. The element of vision missing from radio enables television to be even more lucid in description and to call on even wider range of resources. It is possible that one of the strongest points of this new medium may prove to be its ability to bring a variety of illustrative devices to bear upon the presentation of a single topic. Also, it would seem that the personality of the speaker comes through to the class more easily on television than in radio. Children appear to react more strongly, not always favourably, to a speaker whom they can see. Narrators who possess an easy manner and a warm and genial presence, are likely to become popular figures in a regular television programme, and with every respect to the teachers whom the children know so well, it is possible that a change of personality now and again may prove to be beneficial.

There is little evidence to suggest how television broadcasts might best be used in class ; the experiment was not designed to explore this problem. Inevitably the very novelty of the broadcasts and the presence of observers created a situation quite untypical of normal classroom conditions, and teachers did not have the opportunity to follow up the broadcasts immediately afterwards. Assessment was carried out in a more general way, by the officials of the School Broadcasting Council, but it would not be right here to appraise them.

While we might rightly conclude that illustration of the kind offered by these broadcasts could be relevant and very useful to the teaching of geography, it is not so clear that there is any real reason why the class must necessarily see an event at the same time as it takes place. The outside broadcasts were interesting material, but they gained nothing by being shown in the classroom while the scenes were being shot. They would be equally useful if recordings were shown at any time. Therefore it would appear that unless the educational value of the event depends upon its being viewed immediately, television treatment has very little advantage over sound film. In fact in many cases, film would be more acceptable in the classroom by reason of its careful editing, more polished technical quality, larger and more brilliant picture, and the opportunity which it gives to the teacher to see it first and to plan accordingly.

Against these points, the television broadcast may gain by a greater degree of informality and spontaneity which is lacking in film, and by the ease with which it can be operated. Nor is it necessarily a fact that the technical finish of the television picture will not in time equal that of the 16 mm. film.

In the meantime for geography teaching, this medium remains an interesting possibility and we look forward to the more extensive experiment eventually to be undertaken.

BIBLIOGRAPHY

Roger Manvell, *On the Air*, Deutsch, 1953.

C. A. Siepmann, *Television and Education in the United States*, Unesco, 1952.

B.B.C. and the School Broadcasting Council, *Report on the Experimental Programmes of Television in Schools*, B.B.C., 1953.

R. Palmer, *School Broadcasting in Britain*, B.B.C., 1947.

The School Broadcasting Council, *Geography and School Broadcasting*, B.B.C., 1952.

Ministry of Education, *School Broadcasts* : Pamphlet No. 20, H.M.S.O., 1952.

E. Dale, *Audio-Visual Aids to Teaching*, Harrap, 1947.

Scottish Education Advisory Council, *Visual and Aural Aids in Education*, H.M.S.O., 1950.

J. G. Williams, Radio in Fundamental Education, Unesco, 1950.

M. Wynn, The Educational Possibilities of Television for Children. Extract from " The Essex Teacher ", No. 5, June, 1954.

ARTICLES IN *Geography*

Geographical Association, Broadcasting as an Aid to Geography, Vol. 14, 1927.

J. Fairgrieve, The Use of Broadcasting in Teaching Geography, Vol. 16, 1931.

P. C. Going, Some Comments on the Use of Broadcasting in the Teaching of Geography, Vol. 23, 1938.

F. Meaden, Broadcasts to Schools, Vol. 31, 1946.

ARTICLES IN *Film User*

A. H. T. Glover, Audio-Visual Methods in the Classroom, February to May, 1953.

F. E. Farley, Television in School, January, 1954.

Gordon Davis, School Radios and the Screen. A series of articles published before the beginning of each term, in which filmstrips and films appropriate to the coming broadcasts are reviewed.

SECTION V

Planning

THIS section deals with the planning and arrangement of geography in school. There are two aspects of this:

(i) Planning a syllabus of work.
(ii) Planning a geography room.

and in both cases for many young teachers, it is probably a matter of accepting what they find in their schools, and adjusting their ideas accordingly. Unhappily this may have to be done at times, but that is no reason why they should acquiesce in the situation, or in the teaching of this or that aspect of geography simply because it happens to be " in the syllabus ". A syllabus is not an inflexible directive formed by some omnipotent power, or shaped by pressures over which there is no control. It is made by the teachers themselves, and all young teachers of geography should be aware of the principles which ought to be considered when a syllabus is drawn up. This is the subject of Chapter 10.

Similarly, there are precepts which govern the planning and equipment of a geography room. Many rooms are inconvenient and equipment is short, but a teacher who really *knows what he wants* and who is importunate in his requests can overcome a great deal of inconvenience and make his daily work very much more comfortable.

The planning and equipment of a geography room is the subject of Chapter II.

CHAPTER 10

PLANNING THE GEOGRAPHY SYLLABUS

I have just referred to pressures from outside which might determine the appearance of a syllabus. Chief among these have been the requirements of external examinations and the limitations of the timetable. The second has always been a difficulty, and is likely to remain so. No teacher ever has enough time to do all that he would like to do, and that is not confined solely to teachers of geography. Everyone can make out an excellent case for needing more time. In secondary schools, the time allowed for geography usually varies between 1 to 2 hours per week in the lower forms, and 2 or 2½ hours in upper forms. Although more time would obviously be welcome, this is not an ungenerous allowance, so long as the very minimum time for lower forms is not less than 100 minutes, i.e. a " long " period and a " short " one in the same week. After the first year, there is much to be said for arranging the periods to run consecutively so that more time is available at a stretch. So much geographical work is experimental, with apparatus and map drawing included, that one long period is often very much more profitable than two shorter ones.

With regard to the pressure exerted by external examinations, there is no reason why this should remain so formidable as it once was. Arrangements are very much more flexible now, and it is right to remember that the examining bodies themselves are prepared to consider amendments from the teachers, and indeed, invite them, with a view to bringing the schools and the examinations more closely into line. During the brief period since 1951 it is evident that there is room for re-adjustments of the examination syllabus, which in its turn allows opportunity to re-think the teaching syllabus from first principles. If this is done, then the dominant influence of external examinations ought in time to disappear.

PRINCIPLES

Let us consider what these principles are.

1. *Aims.* First the teacher must be perfectly clear in his own mind as to the aim which he has in view when teaching geography. It is not necessary to consider again what these aims are, for this has been done in Chapter 1, and the student may refresh his memory there. Nor is it necessary that the aims of every teacher should be identical. But it is most necessary that each one should consider the substance of Chapter 1 and establish his aim for himself, and it is probable that amongst the majority there will be a large measure of agreement. When aims are clearly held then a syllabus can be formed, or an existing one can be critically assessed, and in either case the result is an honest attempt to put one's philosophy into practice.

2. *A Comprehensive Syllabus* should cover the world in a 5 year secondary school course. This does not mean that each region should carry equal weight, but it does mean that there should be no noticeable gaps. Obviously those areas which have greater importance in the child's education should receive closer treatment than those which are more remote. A child should be very well informed about his home country, and sufficiently informed on other countries which have close associations with it (either cultural, political or economic) to be able to understand the way they affect one another. The remainder of the world should be dealt with in lesser detail, probably through the medium of selected samples which are typical of the wider regions which contain them.

3. *Systematic Progression* in order of difficulty must be borne in mind when the order of treatment within the syllabus is arranged. Some geographical concepts are more difficult to understand than others; some continents are more complex than others. Therefore, both should be avoided in the earlier years, and introduced later. As an example, the many relationships that must be grasped to understand the idea of a "natural region" are quite beyond the comprehension of children until the middle school at the earliest. Another example may be seen in the continent of Europe, where from every point of view, physical, historical, political and economic, the complexity of its structure makes it quite unsuitable material until the children reach the third or fourth year of their course.

4. *The Relationship of the Various Aspects of Geography* to one another largely determines the shape which the syllabus may take. It was formerly the custom to split the subject matter up into distinct compartments and teach them separately—physical geography, mathematical geography, economic geography, and so on. Fortunately this practice is not now so common, for it leads to the idea of specialisms in the child's mind which most successfully prevent him from appreciating the way in which the different aspects of geography hang together. A syllabus planned in this way would consist of a series of " bits " unrelated to each other, with no conception of geography unifying them all. Fragmentation of this kind is not educationally sound. A central theme, a region or a topic which serve to focus these different parts of geography together is far more in keeping with modern educational practice, and also with the more commonly accepted conception of geography a unifying subject.

Therefore the centre of interest in teaching should be the geography of a region, or some other vehicle which throws light upon a region, such as a typical sample of one part, or a feature of it, and the various geographical aspects, the physical, human, climatic or economic, which go to form its character are subordinate to the appreciation of the whole. This is particularly important in physical work, especially those parts of it which concern land structure. There is still a tendency even today, to teach physical features separately through artificial examples, instead of using those which exist in fact.

In planning the syllabus then, the separate parts of geography ought not normally to appear ; they take their place unobtrusively. This is certainly true in all except the most advanced work. Where students are mature enough to understand that it is sometimes convenient to make artificial distinctions without losing sight of the purpose of geography as a whole, then they may legitimately separate some aspect—physical, mathematical or climatic—for specialised study, and in advanced work this is normally done.

5. *The Relationship between Geography and other Subjects.* Although geography has a great deal of common ground with other subjects, it is possible to force a correlation between them beyond the limits of what is desirable or expedient. In general, the more informal and casual the relationship, the better it is for both geography and allied subjects. This can be effectively done

simply by good relationships between the teacher of geography and his colleagues, and commonsense on the part of them all. If the teacher of French, or Classics, or History, or Religious Knowledge happens to be engaged on a topic which would profit by a geographical background, this can be provided quite easily in a friendly fashion by the geography teacher without making ponderous and elaborate arrangements in the syllabus. It is most probable that the children learn far more from such easy and informal contacts, of the support which subjects can lend to each other, than they do from formal " correlations " which tend to strain the limits of the subjects and try the patience of the teachers.

Similarly, other subjects help the study of geography in a variety of ways, and so far as the planning of the syllabus is concerned, it is simply a matter of introducing certain geographical topics when the children have sufficient supporting knowledge to understand what they are doing. For example, there is little point in teaching the use of scales in maps until the children are thoroughly at home with linear measurement. Latitude and longitude ought not to be taught until they have become familiar with angular measurement. They cannot understand the causes of wind systems, or of seasonal variations of wind direction, or the causes of many other climatic effects, until in science they have learned the elementary notions of temperature, pressure and expansion. It is not necessary to establish formal planning between the courses in the various subjects in order to achieve mutual help. It is simply a matter of each teacher knowing what the other is doing, and quite naturally arranging his own work accordingly. If this is done, topics in geography which concern allied subjects (particularly in physical geography) will not appear in the syllabus until the children are mature enough in intellect to tackle them.

The urge for " breaking down barriers " between subjects in recent years has resulted in the appearance in some colleges and schools of syllabus arrangements in which geography and history are taught together under the general term " social studies ". For some time this practice enjoyed considerable popularity, and indeed, it still does in some of the secondary modern schools, although there are signs that the view is not now so widely held. It arose largely out of an impatience with some of the more remote aspects of the traditional subjects, coupled with the modern educational principle that learning must be made meaningful for the children, and it was given timely support by the extreme overcrowding of the timetable.

All these things may be perfectly true. There is much traditional matter of a sterile nature (but not all of it) which could do with judicious pruning; children certainly ought to understand the purpose of what they are learning; and there is no doubt that lack of space in the timetable is a marked feature of most schools today, which makes the prospect of telescoping two or three subjects into one extremely attractive. But none of this is adequate justification for doing away entirely with the traditional outlook and content of a subject, for this is what a "social studies" organisation must amount to in practice. Geography can only appear within it in a weakened and scarcely recognisable form. Most of the physical side of geography and much of the mapwork must inevitably disappear, and although geographers will probably admit the wisdom of some reorganisation of their subject in the light of modern educational practice, they cannot, (while remaining geographers) totally abandon the characteristic point of view which marks their work. It is this question of view-point which appears to me to be the crux of the matter. The exponent of social studies must regard the dominant element in his teaching as "man, *in* his environment", with the heaviest emphasis on the social pattern which man has created, while the environment occupies a very subordinate position. Most geographers on the other hand, would regard their teaching as characterised by "man, *and* his environment", that is to say, the study of the earth in its entirety, with man as but a part of it. In this case, most of the traditional aspects of geography remain, and so does the traditional geographical method of seeking relationships between them and the recognition of regional entities wherever they may exist.

It is now a question as to whether one accepts the view that the characteristic outlook and discipline of the subject can make a worthwhile contribution to education or not. I take the view here that it does, and further, that other subjects also best exhibit their educational worth when their characteristic disciplines are preserved. It is precisely because historians, and geographers, and other specialists too, possess their own distinctive points of view that their work is most valuable when these are allowed to emerge in their teaching.

There is another aspect of this matter which ought not to pass unnoticed. The fundamental unity of all knowledge in the pursuit of truth is a very advanced and an adult conception, and no doubt the philosophers in their wisdom are able to discern the subtle ways in which the stores accumulated in the various subjects together contribute towards the sum of human understanding. Sometimes a rather emasculated version of this idea is advanced in support of "breaking down the barriers" between subjects in school. But children are not ready for it, and learning is made so much easier for them if it is defined into portions which they can digest—*subjects*—and for which they can recognise a more limited purpose. It is for the teacher to point out that although we may formulate such boundaries largely for convenience of organisation, they are not necessarily absolute, and they are to a certain extent artificial.

Therefore in planning a scheme of work in geography, I suggest that we may agree with the authors of the Spens report in this matter, who say:

> "We think that proposals for unifying subjects should be entertained with some caution. . . . On the other hand there is much to be said for intimate working alliances between subjects provided that their essential autonomy is preserved."[1]

6. *The Relationship between the Homeland and the World.* The position occupied by Great Britain is obviously one of the principal factors in determining how the syllabus should be planned. The logical order is—local district, neighbourhood, home country, rest of the world, beginning at home with what can be seen, and working outwards, ever widening the horizon. This is satisfactory up to a point, but it means that the home country comes very early in the course when the children can deal with it only in a superficial way, and before they are ready to understand the complexities of a modern industrialised society, or the close ties that bind Britain politically and economically with other parts of the world, notably, with the British Commonwealth. Naturally this must be done at some time in the course if they are to be equipped with sufficient geographical knowledge to understand world problems. Therefore the homeland appears twice—at the beginning of the course as an introduction to geographical methods, and again,

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[1] The Spens Report: *Secondary Education*, H.M.S.O.

preferably at the end, when it is studied in relation to the world setting.

7. *Personal Preference and Local Bias.* In addition to the factors mentioned so far, the precise form of the syllabus will reflect the conditions which are peculiar to the school. The teacher's own personal interests may quite legitimately be regarded as one of these conditions, although here one should move with some caution. Most teachers have a specialism in which they feel most at home, and there is no reason why they should not interest children in it also, provided that it is not allowed to dominate the course. The personal enthusiasm that accompanies a special interest in meteorology or geomorphology for example, can often be communicated to children through informal activities arising from school visits, observations, or the geographical society without disturbing the balance of the syllabus itself. Only for advanced pupils who are themselves beginning to specialise, should such special courses appear in the scheme of work.

Very much the same applies to the local situation of the school. Quite naturally the outlook and the background of children at a school in a major port like Southampton, will be quite different from that in a midland industrial city, or in a rural secondary school. Local occupations and sympathies will largely determine the detail of the course, but the balance of the syllabus as a whole must be preserved.

8. *Opportunity for Practical Work.* In addition to the formal work in class, there are the various types of practical activities which have been mentioned from time to time in this book—school journeys, local studies, observations, projects, topical events, and so forth. Many of them will occur out of school time, but the work in the syllabus is often done in conjunction with such activities, either preparing for them or making use of their findings, and these are points which must be remembered when the work is planned.

9. *Opportunity for Revision.* Revision is an integral part of teaching, and proper time for it must be allowed. It is not to be regarded merely as a repetition of the same subject matter in the same form. The aim of revision is to facilitate remembering, and to offset the losses due to lapse of time. To do this most effectively, periodic revisions at spaced intervals are better than a frenzied re-hash at the end of a course. Much work has been done on the

value of revision-periods, notably by Dr. P. B. Ballard, and students are referred to his paper.[1]

In addition to periodic revision of this nature, there is much to be said for a "free" year at the end of a secondary school course, when the content is reviewed from a different angle. If, for example, the course has been planned on regional lines, a year's study of the world at the end of it will bring up very much the same matter, but in different contexts, showing new relationships.

ARRANGEMENT OF THE SYLLABUS

Based upon these principles, the syllabus may be worked out on the following lines:

(1) IN PRIMARY SCHOOLS

The object here is to provide an introduction to geographical knowledge, and to leave children at 11 years of age keen to learn more. More than this it is unreasonable to expect, and systematic work in geography is not really appropriate here. A syllabus to meet this object is:

1. Preliminary observations in the local neighbourhood, including observations of weather and sun.
2. The making of maps of home, school and neighbourhood, and use of local 6 inch sheet.
3. The lives of selected persons in this country.
4. A glance at other countries, through any one of these methods:
    - (a) The history of geographical discovery, exploring the world with some of the famous explorers.
    - (b) The countries which produce our food and drink; the geography of the shop window.
    - (c) Children in other lands.

If the selections in this syllabus are wisely made, children should finish up at 11 years of age with elementary knowledge of their own neighbourhood, of their own country, sufficient world geography to know the names and locations of the continents and the oceans, some features of the countries which they contain and of the lives of the people who live in them. They should have begun an acquaintance with geographical terms in common use, and should know how to make a simple map. They should have an adequate " geographical vocabulary " on which the secondary schools may build.

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[1] P. B. Ballard, "Reminiscence and obliviscence", *British Journal of Psychology Monograph Supplement*, I.

(II) IN SECONDARY SCHOOLS

In the secondary schools more variation in the arrangement of the syllabus is noticeable, not only between the modern and the grammar schools, but also amongst schools of the same type. That there should be a marked difference between the scheme of work for modern and grammar schools is quite natural. It is not only that the school life tends to be rather shorter in the modern school, but the whole emphasis and approach to the work is less academic, and this is invariable reflected in the way the syllabus is arranged.

Although the details of the schemes vary so much from school to school, generally speaking they seem to follow three main patterns :

1. Regional.
2. Concentric.
3. Topic.

Of these three, the regional plan is by far the commonest, and most grammar schools organise their geography teaching in this manner. This will be considered first.

1. *Regional.* The course in grammar schools can be regarded as of five years' duration. In this time a comprehensive syllabus must be completed. Although the suggestion for a primary school syllabus on page 11 ought to provide an adequate geographical foundation, most teachers in secondary schools usually find such wide variations in the standards reached by the children who come to them from different primary schools, that they prefer to lay their foundations for themselves in the first year of the secondary course. Very frequently, the home district, home country, and introduction to the world, forms the material for the first year. This is not necessarily time wasted in duplication. The children are rather older, psychologically they have matured somewhat and their attitude has changed by their promotion to a new school. They can be pressed more firmly, and their work made much more thorough. Although the headings in the first year of the syllabus may seem roughly comparable to those in the school they have so recently left, the grammar school teacher will make the work more

searching, and will teach new skills and accomplishments which were not possible a year earlier. For example, the observations in the neighbourhood go far beyond those made in the junior school, according to what the region has to offer, and observations of the weather are now more exact. In mapwork they move from the local 6 inch sheet to the 1 inch or 2½ inch, and they have more accurate notions of scale, direction and symbolism. They read their maps more thoroughly, and use a variety of sheets. They begin to acquire the basic skills of graphs and sketch maps. They learn to use the atlas. In short, the whole character of their work is now much more geographical, quite apart from the subject matter which they pursue.

In the next three years the world is dealt with by continents, and when choosing the order in which these shall be taken, the principles enumerated above must be carefully studied. Not all the continents are of equal difficulty. The three southern continents are relatively simple by comparison with the others, hence they are suitable for fairly early treatment. If these continents are dealt with in the second year, then North America and Asia must come in the third, for the fourth year ought to be occupied by a detailed study of Europe and the British Isles. The complexity of Europe, particularly the relationships between social, historical, and economic factors as well as the complicated structure make it necessary to deal with it quite late in the course. Both North America and Asia contain examples of structure and climate which can suitably illustrate the physical geography of the third year. Thus a course planned in this manner would be

Second Year : Southern Continents
Third Year : North America and Asia
Fourth Year : Europe and British Isles.

with the appropriate physical accompaniments in each year through examples arising out of the regional studies.

The grading of difficulty in physical work is well met in this arrangement, but the separation of North America from South America is rather artificial. They go more naturally together; they contain a wide spread of climatic zones from north to south, and a varied though not over complex selection of land forms. There is the additional advantage of having access to examples from the northern and southern hemispheres, when dealing with seasonal variations and earth movements which can properly be introduced in the second year. There is also a wide variety in economic and social patterns which lends colour to the work ; a year's syllabus which has a certain sameness about it is inclined to be rather dull for children. If North and South America were taken together in the second year, and assuming that Europe remains in the fourth, there is left a choice of three continents for the third year. In this year, the children should be ready to understand the physical reasons for seasonal variations in wind direction and the climatic changes that go with them ; Asia is the obvious continent to choose for illustration, together with Australia to provide contrast, both in regional types and in social organisation. In this case Europe and Africa must appear together in the fourth year, and although there are close political and economic associations between them which make the arrangement convenient, it always seems to me that this is a heavy burden for one year's work.

The precise combination of continents for each year's study is not inflexible, and there is plenty of latitude for personal choice, provided that it is not made arbitrarily, but after due consideration for the principles mentioned here.

The fifth year is left for a review of the world as a whole. This is *not* intended as a revision year in preparation for the first examination, in the sense that it involves a repetition of the previous three years. Children soon see through this sort of thing, and the work degenerates into mechanical cramming. But there are two reasons why a final year of consolidation is sound practice :

(1) In the first place, the work done in the second, and to some extent in the third year, has a been of a superficial character. Children have matured considerably since they tackled their three Southern Continents, or the Americas. Not only have they learned more, but they are more familiar with geographical methods, and intellectually they are more capable of seeing relationships which formerly were beyond them. It is quite proper therefore that there should be a chance for a second look at those countries which they studied in their earlier days.

(2) Secondly, it is sound to consolidate what they have learned by viewing the world as a whole from a different point of view. If the emphasis has been upon individual regions within the continents, or selections from them, in the three previous years, it is useful to see the same material in a different fashion in the final

year, either through studying regions of a different kind, for example, the "natural" regions (hot deserts, temperate grasslands, and so forth) which as it were, divide the world "horizontally" instead of "vertically" and present quite a different picture. Or attention must be devoted to themes (social or economic themes, or other problems of world importance) which transcend the political boundaries and bring the pupils' minds to bear upon their geography in the world setting. Or they may each study topics, or commodities, requiring them to make use of the knowledge of individual countries which they already possess, and also to go further beyond the standard textbooks to statistical and other sources. If the methods in the first four years have fostered independent work, they should now be able to undertake studies of this nature individually.

It should be remembered that for most of the pupils, this fifth year is the last year at school, and consequently they should have their eyes constantly upon the position and importance of the British Isles in this world survey. The themes, or the topics chosen ought to reflect the especial responsibility of Great Britain in world geography, and our special needs in terms of our own economic position and its relationship to world trade.

Advanced courses beyond the first public examination will naturally exhibit the qualities of more searching specialisation and a narrowing of the field, together with a very considerable advance in scholarship. Although there may eventually come a time when the grammar school course is planned in terms of a seven year period, I take the view here that the normal course will continue for some time to be regarded as covering a period of five years for the majority of pupils, and that advanced courses for those who remain at school beyond the first general certificate examination, do not properly fall within the scope of this treatment.

2. *Concentric*. The practice of covering the world in successive years, each time from a different point of view, and in gradually increasing difficulty is not so widespread as the regional type of organisation. Some teachers prefer it on the ground that it imparts a sense of reality, a thread of continuity, and keeps before the children the "global" view point which is lost when the world is dissected into regions, political, natural, or otherwise.

Such a scheme is embodied in the following arrangement:

First Year. A preliminary world survey based upon the lives of selected people, not unlike the world introduction often found in the traditional regional syllabus.

Second Year. The world, studied from the physical point of view.

Third Year. Climate and vegetation of the world.

Fourth Year. Economic geography of the world, dealing with food, raw materials, markets, and transport.

Fifth Year. A final world survey which consolidates the substance of the four previous years, and with especial reference to the world position of Great Britain.

There is no doubt that a plan of this kind is intensely practical, and it has the merits of emphasising relationships throughout, and also of insisting upon (instead of merely making possible) the teaching of the physical and other branches of geography in the closest possible connection with living examples. It also avoids the tendency to develop " compartments " in the minds of the children, which can happen when regional work is taught unskilfully. It is an interesting arrangement and I have a feeling that a geography syllabus planned on these lines deserves rather more respect than it often receives.

3. *Topic.* A syllabus based upon selected topics has also the merit of keeping very close to reality, and of imparting a sense of purpose which is not always present in the analysis of individual regions. Generally speaking this type of syllabus is found more frequently (but by no means exclusively) in modern schools than in grammar schools. The latter usually prefer to adhere to the traditional discipline of regional studies, and provided this is interpreted in a liberal and enlightened fashion, they are probably right. But modern schools can do their work best, not by endeavouring to imitate the grammar schools with an attenuated syllabus of a similar kind, but by creating their own schemes of work to suit their own needs, and for the majority of their pupils, a sense of practical purpose is far more important than academic discipline.

They should go seriously for the geography of everyday things, not in the rather grim, soulless fashion which deals only in terms of economic facts, nor yet with the half-hearted dabbling of older children occupied with material really suited for the junior school.

A really thorough study of the geography which underlies man's basic needs is no less stimulating intellectually, and very much more purposeful than the study of specific regions. I have in mind the type of treatment where the various topics of food, drink, and raw materials are dealt with in a most comprehensive and invigorating manner, making quite stern demands upon the intellect and the capacity for work of senior secondary school pupils, and I believe that any boy in a modern school (and many in grammar schools) would certainly not spend his time unprofitably if he were to complete such a course.

The actual planning of a syllabus on " topic " lines allows much more flexibility than a regional syllabus. There is more room for personal choice, and not the same need for logical order. In general however, topics are chosen from three main sources :

(i) Topics related to the local district, e.g. industries, or occupations, social or historical topics.
(ii) Topics related to man's needs—food, drink, clothing, raw materials for industry, trade, transport, communications.
(iii) Topics arising from current events, which have considerable geographical significance.

A plan which is typical of many, is arranged in this fashion :

First Year. The local district, with appropriate map work selected lives of persons in Great Britain.
Second Year. The geography of food, clothes and raw materials ; selected topics closely related to local needs.
Third Year. The geography of trade, transport and communications.
Fourth Year. Great Britain and the Commonwealth ; selected topics to illustrate the close political, cultural and economic relationships.

Another appears in this form :

First Year. The geography of agriculture—food and drink.
Second Year. The geography of industry—power and raw materials.
Third Year. The geography of transport and communications
Fourth Year. The geography of world problems—arising particularly from current events, or of recent events with a more than temporary significance.

Clearly any number of variants of arrangements like these could be made to suit the type of district in which the school happened to be situated, the personal preference of the teacher, and not least, the particular interests of the children themselves. It is this possibility for variation which constitutes a large part of the attraction of a syllabus planned on topics rather than regions—that, and the sense of purpose which arises from pursuing enterprises which can actually be seen. There is no reason why the pursuit of topics, and the study of regions should not be combined ; they can often conveniently arise from one another. It is certainly true that work in the schools is likely to be more invigorating and stimulating for the children when the work they pursue is thought out from first principles, and amended and adjusted by the teacher to suit his own particular case.

So does he prevent his teaching from becoming inert.

BIBLIOGRAPHY

Incorporated Association of Assistant Masters, *The Teaching of Geography*, Chapter 3 and 6, and Appendix, Philip, 1952.

J. Fairgrieve, *Geography in School*, Chapters 19 to 21, and Appendix, U.L.P., 1949.

Board of Education, Curriculum and Examinations in the Secondary School, *The Norwood Report*, VI, H.M.S.O., 1943.

L.C.C., *Memorandum on the Curriculum in Secondary Schools*—III—Geography, L.C.C., 1933.

Royal Geographical Society, *Memorandum : Geography and Social Studies.* Also in *The Geographical Journal*, Vol. 116, 1950, R.G.S., 1950.

J. Hemming, *The Teaching of Social Studies in Secondary Schools*, Longmans Green, 1949.

C. M. Fleming, *Research and the Basic Curriculum*, U.L.P., 1947.

Scottish Council for Educational Research, *Curriculum for Pupils 12-15 years, Report No.* 3—Geography, U.L.P., 1931.

ARTICLES IN *Geography*

Sir Halford Mackinder, The Teaching of Geography and History as a Combined Subject, Vol. 7, 1913.

Geographical Association, Geography and the Classics, Vol. 10, 1920.

Leonard Brooks, Geography in Reorganised Schools, Vol. 15, 1930.

P. H. Guenhault and F. L. Ralphs, Geography and Commerce, Vol. 18, 1933.

A. G. Ogilvie, The Relations of Geography and Geology, Vol. 23, 1938.

M. Humphrey Edwards and M. H. E. Murray, An Experiment in the Integration of Geography and History, Vol. 26, 1941.

L. B. Cundall, What Geography should a Boy of Sixteen know?, Vol. 31, 1946.

R. Milward, The Place of Travel in the Geography Syllabus, Vol. 33, 1948.

H. R. Lyons, Local Geography and the Five Year Course in a Grammar School, Vol. 34, 1949.

O. J. R. Howarth, The Commonwealth in the Geography Syllabus, Vol. 39, 1954.

CHAPTER II

PLANNING AND EQUIPPING A GEOGRAPHY ROOM

GEOGRAPHY must be taught in a special room for these reasons :

1. There is apparatus to be stored and set up in preparation for lessons.

2. Quite often, the work undertaken is not completed within a lesson period. I refer particularly to the more practical kinds of work, such as the making of models, charts or large maps which may be spread over a considerable length of time. These things cannot be done unless there is space where they can be left undisturbed in the unfinished state. Also, it is convenient sometimes for a piece of illustrative apparatus (such as an illuminated globe) to remain set up for a while where children can handle it for themselves. This can only be done in a separate room.

3. Collections of models, specimens, and illustrations tend to accumulate, and they should be properly arranged and displayed with taste. There must also be room to store those which are not needed for immediate use.

4. There is special equipment needed if the subject is to be properly taught. Tracing tables, globes, a sand-table, are examples.

5. As in any other subject, particularly those which have a strong practical and experimental element, a certain " atmosphere " develops in the place where they are taught, created partly by the array of outward and visible signs—the apparatus and the visual displays—and partly by the distinctive psychological climate which surrounds them. These things are not unimportant in suitably conditioning those who participate. From the science laboratory there emanates a sense of scientific purpose ; the woodwork room conveys the impression of craftsmanship and competent industry ; on entering the gymnasium one experiences the pleasurable anticipation of physical exuberance. In the geography room there ought to be a similar distinctive quality—that of a " geography working-place "—a laboratory devoted to geographical pursuits

where the young student is conditioned in a geographical atmosphere, where he finds everything he needs for his work ready to hand.

In planning the room there are two principal considerations:

1. The design and arrangement of it.
2. Equipment to be used in it.

1. Design

The room must be planned for these purposes:

(i) Adequate seating for a class.
(ii) Adequate working arrangements.
(iii) Adequate storage space.

(i) SEATING

In secondary schools a class consists of not more than 30 children.[1] Although this is the official figure which ought not to be exceeded, classes are frequently larger. It is small comfort for the teacher to know that in time his numbers may drop when for the present he is faced with the uncomfortable congestion arising from the presence of 40 children in a room designed for 30. It would be so much more agreeable if space were available for a larger number, and then when the numbers decreased, there would be all the more room for additional working space. Building Regulations specify for secondary schools one classroom of 900 square feet in a school of one form entry, two such rooms in a school of two form entry, and three such rooms for larger schools. One of these should certainly be available for the geography room, although 1,000 to 1,200 square feet is a more suitable allowance. In large schools its is probable that more than one class will be taking geography at the same time, and a second smaller room not so extensively equipped should also be available.

The conventional type of desk with seat is now largely being replaced in geography rooms with tables and separate chairs. Long tables rather like the laboratory benches found elsewhere are not very satisfactory. Smaller tables seating four children at each table are rather better, for they can be rearranged to give a larger surface area for group or project work, or for special displays. Children can sit round these tables in groups, and a certain community feeling of mutual co-operation grows up within these little groups which is very desirable. It is not really necessary that each child should sit facing directly to the front of the class. In groups they can turn quite conveniently to face the teacher during his personal teaching, and also towards any other part of the room if the occasion demands it. The " front " still remains the focal point of the class during collective teaching, but since the tendency today is directed more towards group or individual work, the tables allow a more flexible arrangement. For smaller children they have the disadvantage that they are rather less convenient for writing than the forward-sloping desk, and they are frequently too high for comfort. These points must be noticed. So too should the question of noise. Movement of children to and from tables and individual chairs is far more disturbing than it is when fixed desks are used. Chairs and tables should certainly be fitted with rubber feet.

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[1] *Primary and Secondary School Regulations*, S.R.O., 636/45.

(ii) WORKING ARRANGEMENTS

For the teacher, there must be a desk or a demonstration bench at the front of the room. It helps the teacher to be lifted up a little higher at his teaching position, so that he can more easily keep contact with the children at the far corners of the room. A dais running along the front wall will do this quite conveniently.

For the children, the tables accommodate their routine work in class. Natural lighting should normally fall from the windows on to the working area from the left side to an intensity of 10 to 15 foot candles at desk height.[1] If children are sitting as groups facing in various directions, it follows that light from the windows must come from more than one side. The principal light should come from the main window on the left-hand side facing the front of the class. Provided illumination is adequate these windows should not occupy the whole of the wall, for a classroom with too much glass soon suffers from overheating and glare, especially if it has a southern aspect. What our American friends would call " glass-block fenestration " can be overdone. Subsidiary daylight should come from small windows high up on the opposite wall, or from lights in the roof.

Working space elsewhere in the room must be provided for other activities apart from class routine. A long table or bench running the whole length of one wall is very useful for model making (unless this can be done in an annexe), for making of charts, for setting up apparatus to remain for a period, or for a sand tray. A part of this bench can be set aside for a tracing table with concealed lighting and glass top. If this table runs along the left hand wall below the window (and this is a good place for it), then the top of the tracing table must be shielded from direct light.

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[1] *See :* The Illuminating Engineering Society, *Lighting Reconstruction Pamphlet* No. 3. " Lighting in Schools ", 1943.

(iii) STORAGE SPACE

There is little space to spare within the geography room for storage of equipment. Cupboards and map chests can be housed below the table mentioned in (ii) above. There should be glass-fronted cupboards or shelves, preferably on the back wall of the room, to take the geography reference library, and the modest museum of specimens which will soon be collected.

For bulky material, and as an annexe to the room, a small preparation or store room is quite essential. It is convenient if this room is placed behind the front wall, with a communicating door between. If sufficient space can be made available here, it helps a great deal to have the room fitted for model making of the rougher sort, with a bench complete with vice, a sink, and a gas ring for heating. There is always a certain amount of debris connected with model making, and it is nice to keep it out of the teaching room if possible. If this room is fitted with a sink, it is but a small step to provide blackout for the window, and the room can then become a dark room where the teacher makes his own 2 inch slides and filmstrips. In this case, let the dark room have two separate working spaces, a "wet" one near the sink for developing and fixing—a draining board is sufficient—and a "dry" one away from the sink, for printing. The model-making bench will do for this. It is important that these two should be kept apart so that dry negatives do not become contaminated when printing is done.

2. EQUIPMENT

Here I refer not so much to teaching equipment such as the barometer, meteorological instruments, chains, staffs, levels, and plane table, which are usually only stored in the geography room, but taken outside for use (except of course for the barometer which should not be disturbed); I refer to the equipment which in a sense becomes a part of the room itself. Apart from the wireless receiver (housed high up on the front wall, pointing slightly downwards towards the class), this is principally the visual equipment, viz :

Blackboard.
Display for wallcharts and maps.
Display for illustrations.
Globes.
Specimens.
Models.

Of these the first three are needed for immediate use for lesson illustration. The others provide a permanent background for casual study by children at times other than lesson periods.

In arranging the room, those items immediately required for teaching must occupy the front wall, and they must be so placed that they can be seen comfortably by the class, and used conveniently by the teacher, if necessary all three together. These items are :

1. The blackboard.
2. Display of one wallmap.
3. Screen for projection.

The other items :

4. Other wallcharts and maps.
5. Display of illustrations.
6. Globes, specimens, and models

may be arranged at the sides and rear of the room.

Of the three essential items, the blackboard is indispensable ; but a wallmap or the screen may be required at the same time and these things have a habit of obscuring the blackboard and each other. This is avoided in the following layout.

1. THE BLACKBOARD (FIG. 80)

The blackboard must always come first. It occupies pride of place and any other apparatus is arranged around it. It is the focus of a lesson ; there can never be too much blackboard space. For this reason I prefer the long board with olive green or black matt surface running the whole length of the front wall at a convenient height for easy viewing, which means a raised dais below it. The board may be fixed or sliding, continuous or in separate panels which lift out of their frame for using the reverse side :

but whichever type is chosen, the front wall should be devoted to this purpose entirely. Cupboards, tracing tables, map chests and the like have no place here; they should be put elsewhere.

One panel of this blackboard should be set aside for a permanent map of the world to be incised or painted in outline upon its surface. If the panels are reversible, another side can be spared for ruling in 2 inch squares. A long board of this kind is much more valuable to a teacher than a number of smaller boards. There is no space wasted with frames or unused sections of the wall. The whole space available is devoted to teaching which is as it should be, and the teacher may divide up his board into panels of varying size to suit his purpose of the moment.

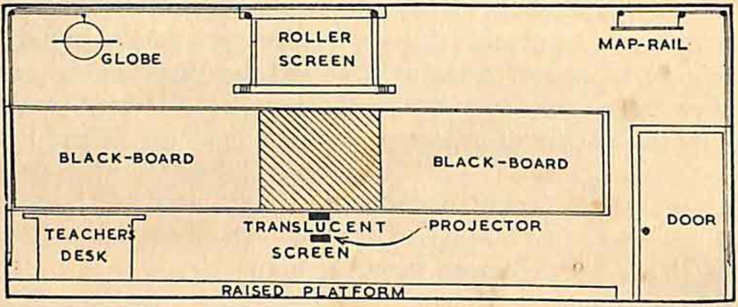

FIG. 80. The Front Wall of the Geography Room.

Another very useful type, the vertical roller with olive green fabric surface is quite convenient, and this is recommended by the Scottish Education Department in preference to any other.[1] The blackboard should be illuminated by strip-lights from above, with shades concealing the light source from the eyes of the children. These lights should be controlled by a separate switch so that the board can be illuminated when the rest of the room is in natural daylight.

2. DISPLAY OF ONE WALLMAP

It is not often that more than one wallmap is needed at any one time. But it should not be hung over a spare easel or pinned to the blackboard. In either case it obscures space which is intended for another purpose—blackboard space. The best solution lies in the long wooden rail suspended by cords at each end, the cords running over pulleys screwed into the ceiling. On the front of the rail are hooks at suitable distances to take the eyelet holes in the top of the map. The rail is lowered while the map is adjusted in position and then it is raised again to the required height. When not needed for teaching, it can be raised to full height, so releasing blackboard space for use. The map is still visible for reference if it is needed. The rail and its pulleys should be fixed to one side, facing slightly across the room (Figs. 80 and 83).

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[1] Scottish Education Department, *Memorandum on Visual and Aural Aids*, 1951 (Cmd. 8102).

An alternative is the fixed curtain-rail at a fairly considerable height above the blackboard. This has the advantage of being cheap, simple, and out of the way, but maps must be put in position with a map-pole which is never an easy operation.

3. SCREEN FOR PROJECTION

A cursory glance at a picture held up before a class or passed round from hand to hand is never satisfactory. Few pictures are large enough to display for analysis by a whole class at once, and pictures circulating amongst the pupils are distracting. The problem is to produce a picture large enough to be used by everyone in the room at the same time. Inevitably this means projection of some kind. There are two methods. If the pictures are small, then it is best to use the episcope. Alternatively, transparencies can be used in one of the diascopes—either the lantern, the filmstrip projector, or the film projector. For practical purposes the difference is a matter of forward projection on to a fixed screen in darkness with the episcope, or projection in daylight or controlled daylight with one of the diascopes. In either case the placing of the screen is our problem for the moment. If the episcope is used the room must be darkened. There is no escaping this, for the nature of episcopic projection entails such loss of light that an efficient picture can only be obtained in darkness. The best type of screen in this case is the beaded screen rolled round a circular roller and slung up to the ceiling on pulleys when not in use, in the same way as the map rail already mentioned. The slight difference is that the cords on which it is suspended at each end are coiled round the roller as the screen is raised (Fig. 80). In this way the screen is rolled tightly when not in use, and remains slung up to the ceiling with the front surface protected from dust. Provided the raising and lowering is done with reasonable care, no harm is done by rolling to the beaded surface. Since the room is in darkness when the screen is in use, obscuring the blackboard does not arise.

This type of screen is preferable to the portable box type. Portable screens need to stand on a table, or on desks, or on tripod screen stands. These are rarely high enough, and valuable time is lost in setting them up and taking them away again.

The darkened room is the principal disadvantage in this method of projection. If projection is used at all, it should interfere as little as possible with the structure of the lesson. Therefore daylight must be preserved in the room—sufficient daylight at least to allow the scholars to use their books and atlases and the teacher to maintain his proper position near the blackboard. In short the lesson continues and ventilation is not impaired. This can be done by using rear projection with one of the many translucent screens now available. There are several; some stand on a table top,[1] some are mounted in cabinets,[2] some are mounted on trolleys which may be wheeled from place to place.[3] All of them give an efficient if directional picture but all of them are cumbersome in appearance and occupy valuable space. Although these screens do meet the needs of the teacher in preserving daylight and position their very size and structure, with hoods and mirrors, constitute a distraction from the picture. The apparatus needed to introduce a projected picture to a class ought to be unobtrusive and also—again this question of time—no time should be lost in setting it up. Practising teachers know only too well that with the change of classes and the many other inevitable interruptions time is rarely available for setting up projection equipment. A permanent installation is the solution, and this can be done with the following layout. Assume that the geography room has its storeroom behind the front wall. On this wall is a sliding blackboard. Behind the centre panel a rectangular space is cut in the wall, rather like a serving hatch, large enough to take the screen surface. The screen is let into this space with its front surface flush with the wall. The mirror can be detached and mounted on the rear wall of the storeroom tilting slightly forward. Below the screen a second smaller aperture is cut with a cover which will hinge down to form a flap. On this flap the projector stands pointing backwards into the storeroom and directed on to the mirror. The line of projection is then from the projector to the mirror, and from the mirror to the screen, the

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[1] For example—The Stableford Screen.

[2] For example—The " Sofil " Rear Projection Cabinet.

[3] For example—The " Westone " and the " Brooklands " Daylight Screens.

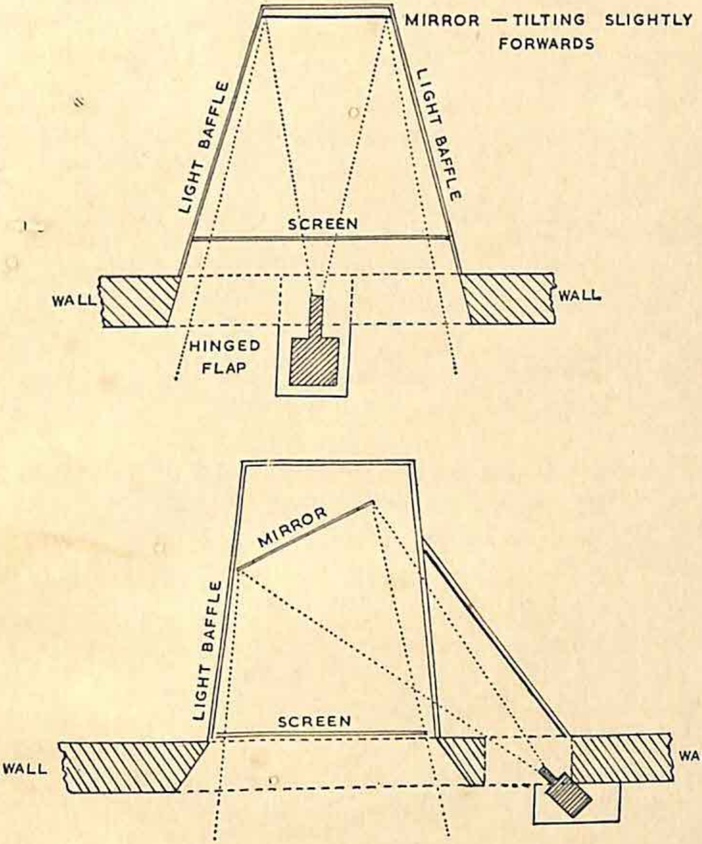

FIG. 81. Alternative Arrangements for Rear-Projection.

picture appearing to the class through the translucent surface (Fig. 81). In this layout, the standard lens of 4 inch focal length fitted to most projectors, gives a screen picture of 30 inches with a throw of 8 feet using the double frame mask. Alternatively the whole screen unit with mirror attached can be let into the wall, the projector standing to the side of it, and in this case a lens of 2 inch focal length should be used, with a total throw of 4 feet to give a picture of the same size. In either case the apparatus is completely out of sight except for the screen surface, and this is covered by the sliding blackboard when it is not in use. It is a good plan to provide some additional covering also, to protect the translucent surface from chalk dust.

The advantages of this particular method are these: as the arrangement is permanent there is no setting up to be done; there is no distraction and no space occupied by bulky equipment in the front of the class; there are no trailing cables to catch the feet of children moving in the classroom; if the storeroom is blacked out, then no blackout is needed in the classroom itself. In addition since all translucent screens are necessarily directional, the screen must be set back as far as possible from the class, otherwise the critical angle, normally about 30 degrees gives a very poor picture for children sitting at the sides of the room. This method puts the picture as far back as it will go—on to the wall itself—and therefore it is visible to all. Finally the teacher has everything to his hand—blackboard, projector, and picture—all in the normal position for class teaching.

I have described this built-in screen in some detail, for it is one of those educational devices now available for classrooms which is really efficient, It does exactly what is required of it; it provides a picture with the minimum preparation in a position where it can be seen by everyone, in sufficient daylight, and with the teacher in his right place.

Power points and switches are provided below the blackboard for rear projection, with another point at the back of the room for use when forward projection on to the beaded screen is required.

These three items—blackboard, wallmap and screen, are the three fundamental illustrative aids which are required for teaching purposes.

The arrangement of the remaining visual apparatus in the geography room is as follows:

4. OTHER WALL CHARTS AND MAPS

Apart from the wallmap required for teaching, other maps and wallcharts can be accommodated around the walls elsewhere in the room. If one wall (on the left of the children) is taken up with windows, the opposite, and the rear walls can be panelled with beaver board or insulating board or some similar substance to a height of 8 or 9 feet giving scope for display of charts and maps.

Prominent among these will be the Current Events Chart, a section of the display area reserved for topical events, preferably near to the door. An outline wallmap of the world on a large scale can be kept for use with visual displays. If the map is pinned up and covered with perspex, it can form the centre-piece for a series of displays which are changed as often as circumstances require.

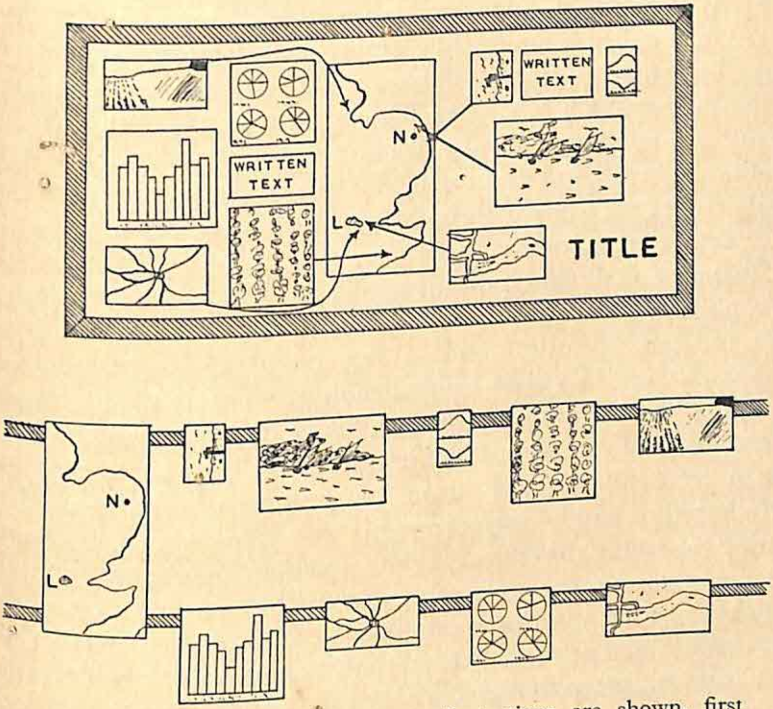

FIG. 82. In this figure, the same illustrations are shown, first grouped as a *composite* chart (or *unit* display), and secondly pinned on to pin-rails The first arrangement is obviously more useful than the second.

5. DISPLAY OF OTHER ILLUSTRATIONS

Small pictures are often needed to illustrate a topic or an event, arranged in conjunction with a central map, as above, or in the form of composite charts.[1] A large area of panelling is ideal for displays of this kind. It permits more flexibility in arrangement than do pin-rails, and it is therefore to be preferred (Fig. 82).

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[1] See Chapter 8 for the principles governing the construction of composite displays.

6. GLOBES, SPECIMENS AND MODELS

These are usually permanent displays and they can be kept at the back of the room, to be brought forward for teaching when needed, with the possible exception of the globes.

There ought to be at least two of these, one black, with the outlines of the continents in white, which is kept for demonstration. It should have a matt surface which will take chalk. The other, with political colouring, is for general reference. These globes may either be mounted on individual stands, or slung from the ceiling with pulley and counterweights, in either case, inclined at the proper angle. A " free " globe, standing in a cup, is also useful. Children can handle it and move it about as they wish. Globes are heavy and expensive, and consequently, they are often smaller than they ought to be. A 19 inch globe is a good size; a 12 inch is just adequate.

Specimens of all kinds soon accumulate. They should be stored in cupboards with shelves or drawers so that they are free from dust and can be easily found. There ought also to be a display always on view, in a glass-fronted cabinet. This is a " geography museum " and it always attracts a lot of interest from children. The glass doors in the cabinet are purely to keep out the dust—not to keep children away from the specimens. The more they are allowed to handle specimens, the more they learn from them, getting the feel of the texture, or the weight of an ore, for example. Geological specimens are freely collected by everyone during the holidays. Other specimens can be collected from industrial firms, museums,[1] and particularly from the Imperial Institute which has excellent specimens available for schools. Apart from this general museum, there is much to be said for arranging periodically a special display related to a specific topic, a " pièce de résistance " which attracts more than ordinary attention. If it is at all possible, there should be a special handsomely-made cabinet for this, a glass cabinet standing some three feet from the ground, with its main display panel sloping backwards, on which specimens are secured with pins or tapes. It is illuminated by concealed lighting from within. Although a display cabinet of this kind is obviously a luxury, it really fulfils a valuable purpose in setting standards of good taste in display, and this is always well worth doing.

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[1] The Derbyshire Local Education Authority has an admirable Museum Service for its schools. Information from the Director, Miss B. R. Winstanley, Park Grange, Duffield Road, Derby.

Models. Large models, relief models, models of coalmines, ports, docks, etc. must stand on tables at the back of the room. There should be a relief model of the local district, preferably standing near to a window so that the area which it represents can be seen also.

* * * * *

Within these general arrangements teachers will be able to work out their own room plan for themselves. A typical plan is given in Fig. 83. There are many variations of the principles mentioned here, and local additions can easily be incorporated by inventive persons. For instance, some like to have the compass points painted on the ceiling and the meridian line marked on the floor. Another ingenious arrangement is a set of rolled wall-maps mounted on the principle of the spring-loaded roller blind. A frieze can be made showing the stages of geological time, or the history of geographical discovery, or some other visual sequence; or the names of prominent geographers or explorers may be displayed round the walls.

All these thing add interest and atmosphere and they all help to make the room an agreeable place to work in.

TO CONVERT AN EXISTING ROOM

In older schools where space is more limited, it is rarely possible to incorporate all the features mentioned in this chapter, but it is not uncommon to adapt an existing room for use as a geography room. Quite clearly 600 square feet will never permit the same generous provision of seating, working, or storage facilities as 900 square feet, but very much has been done by enterprising persons even in the most unpromising surroundings. The principles which govern the arrangement of the room do not alter. The "teaching equipment" (blackboard, display of one wallmap, and screen) must still command the room while "display equipment" (other wallcharts, wall displays, display of specimens and models) are arranged elsewhere.

Quite apart from being somewhat smaller, classrooms to be adapted are often broader than they are long, and they are

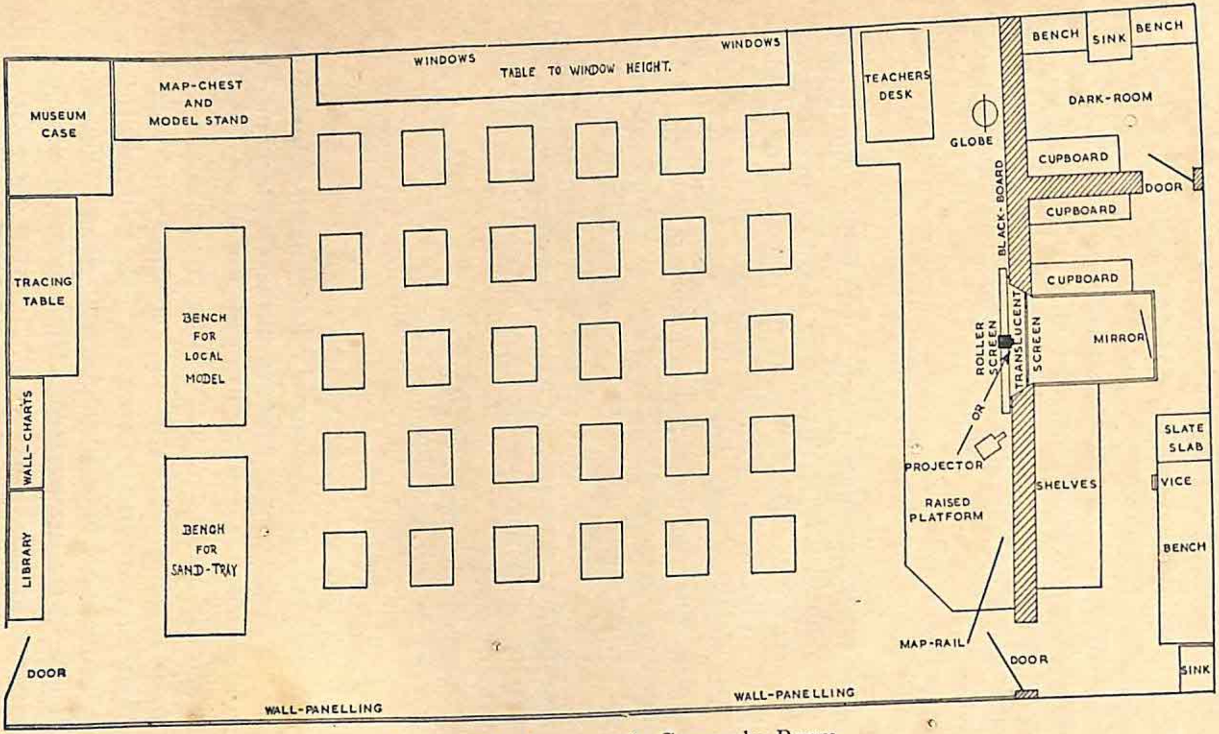

FIG. 83. The Lay-out of a Geography Room.

Note. This room is planned on a generous area allowance of rather more than 1,200 square feet. It can be reduced to approximately 1,000 square feet by dispensing with the two extra benches for the local model and sand-tray, so saving considerable space at the back. The rest of the room is not affected. Individual desks are shown, but tables for small groups will go equally well in the same space. Alternative positions for the projector are shown, either at the side of, or below, the translucent screen.

invariably without the annexe behind the front wall which can be so easily adapted for rear projection. There are two main difficulties which arise as a result of these features. The first is that children are often sitting closer to the blackboard than they ought to be, and secondly, when projection is done, the line of best vision falls down the centre of the room. In both cases, the children sitting at the sides and near to the front are at a disadvantage (Fig. 84). This difficulty can be partly overcome by using tables instead of desks. They can be moved to make the best use of the floor area, and they have the additional advantage that if by good fortune, there should be fewer children in a class, those who are present can spread themselves more freely, fewer children using each table. This cannot be done when individual desks are used, for then fewer children at any time simply mean empty desks, and this is so much space wasted. Tables measuring four feet by two feet can accommodate only two children, but each one has a work-

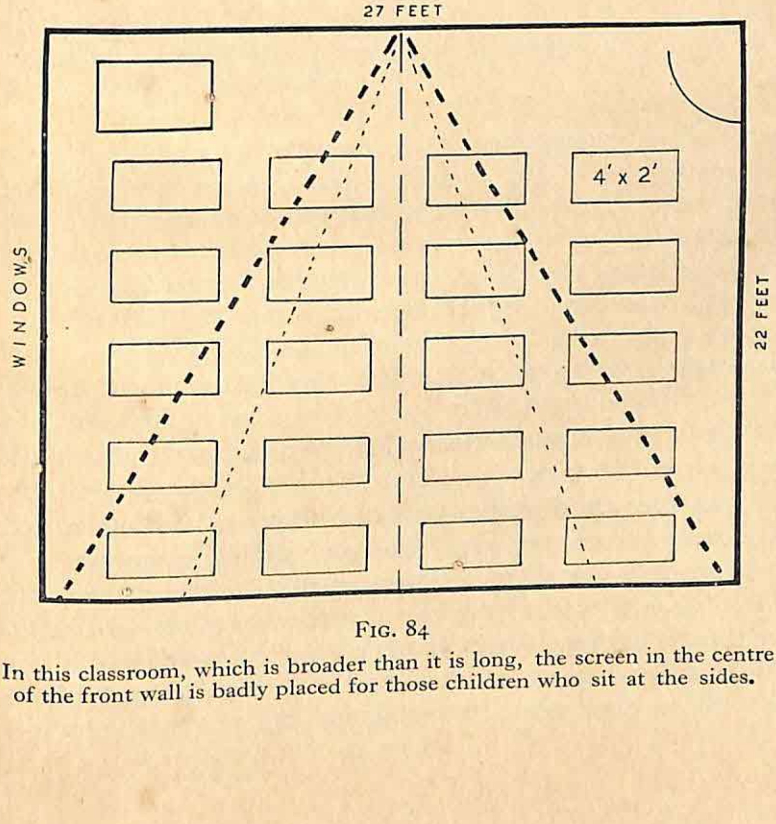

Fig. 84

In this classroom, which is broader than it is long, the screen in the centre of the front wall is badly placed for those children who sit at the sides.

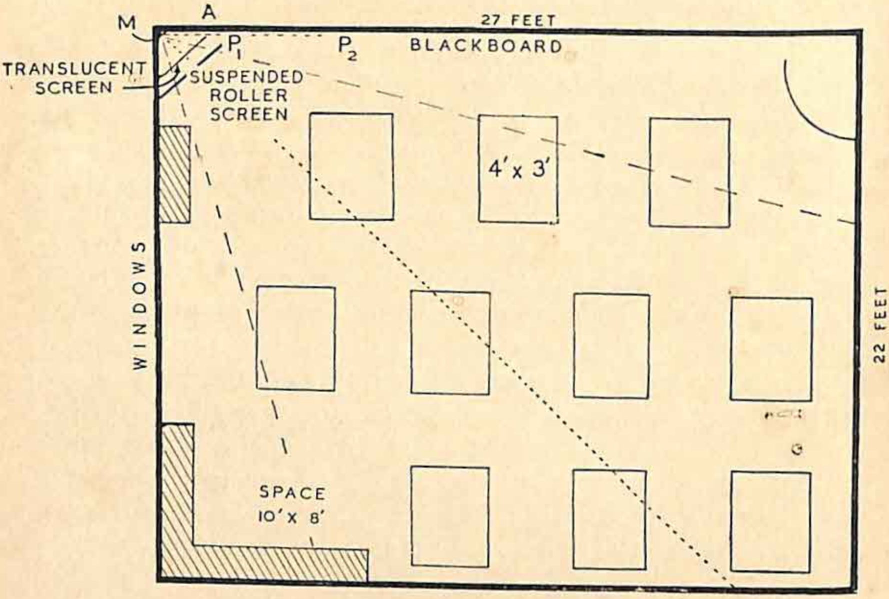

FIG. 85

When the screen is placed diagonally in one corner, as in Fig. 85, more children are included in the best viewing-area.

ing area of four square feet which compares favourably with two and a quarter square feet given by a desk eighteen inches square. Twenty such tables for forty children can be fitted into a room measuring twenty-seven feet by twenty-two feet, but there is little room for anything else (Fig. 84). Tables measuring four feet by three feet will take four children but with rather less working space for each child. However, they are adequate if ledges are provided underneath to take books and pencils not needed for immediate use. Only ten tables of this size are needed for a class of forty children and these can be arranged with sufficient space between them in a very much smaller floor area. This brings more children into the best "teaching-area" with a view of blackboard and screen, and also allows a certain amount of room for additional working and display space at the sides. If there should be fewer than forty children, then they have the use of rather more table space for their work. If there should be no more than twenty, then two children to each table of this size, is a very generous allowance. When these tables have children sitting at both sides it is convenient to arrange them as in Fig. 85, so that no child is sitting with his back to the blackboard. The only difficulty here is that some children must sit with their backs to the windows. This does not matter so much if there are window lights high up on the opposite wall also, and this is very often the case.

Suggestions for the size and type of blackboard do not differ from those given earlier in this chapter. It is still advisable to devote as much space on the front wall as conditions permit. It is not quite so easy to site the screen. The middle of the front wall is no longer a suitable place for either forward or rear projection. Distortion becomes a serious handicap for children who sit beyond thirty degrees from the centre, and in addition to this, the directional properties of beaded and translucent surfaces give an indifferent picture to those who sit beyond twenty degrees from the centre, and a very poor picture to those beyond thirty degrees. In both cases the children at the sides are excluded *(Fig. 84)*. They can be brought in to the angle of good vision by moving the position of the screens to the corner of the room as shown in Fig. 85. It is still desirable to have two screens. There should be a forward screen for use in darkness with the episcope, and it is convenient that this should be a rolled fabric screen suspended from the ceiling. If it is possible to arrange the seating so that all sit within the thirty degree angle on each side of the centre line, then there is no doubt that the beaded surface is superior to any other. But if the shape of the room requires a substantial proportion of the seating to remain outside this angle, then the matt screen should be used. There should also be a translucent screen for use in controlled daylight. This can easily be made in the school, so long as the following principles are observed:

(i) The screen surface is mounted so that a line normal to it lies down the centre of the seating area.

(ii) The mirror is mounted so that the angle of reflection (which is the same as the angle of light incident upon it) coincides with this centre line.

(iii) The space behind the screen surface is enclosed to the walls, making a light-proof path from mirror to screen. A port hole is left at the side of the screen by the front wall (point "A" in Fig. 85), to take the projection beam.

G.T.C.

> The amount of stray light entering by this port hole is very small, and is not sufficient to degrade the quality of the picture.

This arrangement occupies the minimum of space. It fits neatly into the corner of the room, rather like a corner cupboard at any height which the teacher finds convenient. The slide- or filmstrip-projector stands upon a bracket on the front wall pointing at the mirror. The distance from projector to mirror varies according to the size of screen, and the size of frame in use. The length of throw for the double-frame size (18 mm...36 mm.) with both 2 inch and 4 inch lenses, is given earlier in this chapter. There is no room situation which cannot be adapted for perfectly satisfactory projection so long as due thought is given to the seating-area, the position of dominant light, screen properties, and the power of illumination at the projector. In each room the precise siting of the equipment needs to be worked out to fit the special circumstances. Projection in exceptionally difficult room patterns can be solved by employing special methods. For example, in certain circumstances it may be convenient to use a silver screen which has specular reflecting qualities, i.e. the line of best vision is not necessarily normal to the screen surface. Sometimes it is possible to use a hinged panel painted matt white on one side and black on the other. In another case, a picture may be thrown upon a screen placed high up above the blackboard by using a reversing mirror. Students are referred to the bibliography at the end of this chapter, to those works which deals with projection in more detail, so that the best use can always be made of existing conditions.

DISPLAY

Older classrooms with fewer windows are often more generous with display space on the walls, than modern rooms. The walls should be covered with an uninterrupted area of material suitable for drawing pins. Display of specimens and of materials is not so easy in older rooms where floor space is limited. The teacher will have to fit in additional cabinets or tables as his circumstances permit. It may mean that cabinets containing geographical materials have to be displayed elsewhere in the school, in one of the corridors for example. Old schools sometimes have odd corners which are of little use for any other purpose, but which can quite well house a display cabinet. If this is well arranged, and illuminated with interior lighting it adds generally to the attractiveness of the place, and it also helps to bring the work in geography to the notice of a wider public.

Similarly older rooms allow very little space for storage. The best use should be made of fitted shelves and nests of drawers beneath those few tables for which room can be found. If it is at all possible to include additional tables, one of them should certainly be fitted up as a tracing table.

Model-making and photography both demand running water, with a sink and some arrangement for heating. This is invariably a major difficulty in older classrooms, and it may mean that activities of this kind have to be done in the craft-rooms where these facilities are available. Although this may not be quite so convenient as having everything to hand in one room, it is better than doing nothing of this kind at all, and it might well serve to promote liaison between geography and other departments of the school work, making for good relationships all round.

If the room is used as a classroom, it helps if the personal belongings of the pupils are kept in lockers outside in the corridor, so that there shall not be unnecessary interruptions.

BIBLIOGRAPHY

Incorporated Association of Assistant Masters, *The Teaching of Geography*, Chapter V, Philip, 1952.

V. C. Spary, *The Modern Geography Room*, Philip, 1938.

Geographical Association, *The Geography Room in a Secondary School*, G.A., 1954.

G. H. Gopsill, *Projection in School*, Current Affairs Press, 1953.

British Standards Institution, *The Standard for a Filmstrip Projector*, B.S.I. No. 1915, B.S.I., 1952.

British Standards Institution, *Installation of Optical Apparatus in Educational Establishments*, Code No. 412, B.S.I., 1953.

Illuminating Engineering Society, *Lighting in Schools*, Pamphlet No. 3, I.E.S., 1943.

Ministry of Education, *Building Regulations*, S.R.O. 345/45, H.M.S.O., 1945.

Ministry of Education, *Primary and Secondary School Regulations*, S.R.O. 636/45, H.M.S.O., 1945.

National Institute of Industrial Psychology, *Report No.* 7, Improving the Blackboard, N.I.I.P.

ARTICLES

B. E. Gillet, Classroom Provision and Problems, Visual Education, July, 1954.

G. H. Gopsill, Projection in Daylight, Film User, May-October, 1952.

APPENDICES

APPENDIX I

A LOCAL SCHOOL JOURNEY

IN this appendix there is given an example of a local study undertaken by boys of a Nottingham secondary modern school. The purpose was defined as a study of the Lower Trent, and a party of twelve boys with the geography teacher, boarded the motor barge *Greendale* at Nottingham wharf and completed the journey downstream to Hull. The geography of the river was explained before the journey and each boy either individually, or working with others, was responsible for collecting information relating to a specific topic on the journey.

A student from the Department of Education in the University of Nottingham accompanied the party to take the photographs which were later made up into a 35 mm. filmstrip for the use of the school and the Local Education Authority. This work also was done by students in the Department of Education.

The journey lasted for four days, and during this time the party lived and slept on board.

Returning to school, the boys read up their topics and organised their material. A copy of a report in full has been bound and put into the school reference library. It contains written accounts, enlargements from the photographs, and many maps and diagrams. An exhibition was also held, setting out all this information for the rest of the school to see.

* * * * *

The following account is an abbreviated version of the full report.

THE LOWER TRENT

THE HISTORY OF THE NAVIGATION OF THE RIVER TRENT

There is little evidence of Roman occupation on the river, but at Littleborough the remains of a Roman causeway can be seen, and at Cromwell there are the foundations of a Roman bridge. This was first seen during low waters in 1792.

From the time the Normans occupied the river to the eighteenth century, the history is one of quarrels between the townspeople on the one hand, and the people engaged in transport, agriculture, and fishing. It was their job to construct weirs, staunches, and fish-weirs or kiddles, as they were often called.

In 1783 a body of 86 men and 2 women was formed, known as the Company of Proprietors of the River Trent Navigation. By Act of Parliament they could improve the channel of the river from Shardlow to Gainsborough, with a hauling path along the bank. Up to this time boatmen had carried on by themselves overcoming obstacles made by nature, or by the owners of mills or fish-weirs. To improve a river for navigation, it needs to be dredged, and locks and weirs have to be built. The reason is that when there is not enough water in the river, it spreads out if the river is broad, but it can be made deeper in two ways—by narrowing the channel between banks or training-weirs, or by damming the water up with weirs built across the river. In this way the water fills up behind like a reservoir before spilling over into a pond below, and so providing the necessary depth. To pass boats round the weirs, gates and a short canal are built. These connect the two ponds. This is the ordinary lock and weir system of river canalisation.

On the 24th June, 1783 the Proprietors of the Trent Navigation met together at the Blackamoor's Head, Nottingham to put the Act into use. The company included the Mayor of Nottingham, the Duke of Newcastle, and Lord Middleton. A committee of the Company appointed Mr. William Jessop as engineer to carry out the work of navigation. A hauling path was constructed from Shardlow to Nottingham, and later from Nottingham to Gainsborough. The channel was improved by dredging, training-weirs and by passing round the worst parts with side-cuts. Later still, locks were made to increase the depth of the channel.

In Mr. Jessop's report of 1793, he mentioned that a loop of the river had been cut off at Bode, near Gainsborough, and another at Burton. These two bends are the basis of an episode in Shakespeare's *Henry IV*. For Glendower, Hotspur, and Northumberland, it was intended to divide the country into three parts—west of the Severn, north of the Trent, and between the Severn and the Trent. Hotspur, joking, complained that a large part of his share was lost to him owing to the meandering of the river at Burton:

> " Methinks my moiety north from Burton here
> In quantity equals not one of yours.
> See how this river comes me cranking in."

THE BARGE AND THE CREW

The Barge. The barge is the *Greendale*, moored at Trent Lane. It is roughly eighty feet by thirteen feet. In the centre is the hold where the cargo is stored. This occupies most of the space. On either side of the hold there is a narrow space for walking, about one foot wide. The engine is at the back, and the wheelhouse is just in front of it. The crew's quarters are at the front. There is a mast, which is only put up in harbour, or in the Humber. There is a small lifeboat.

In the engine room is a three-cylinder engine, giving a maximum speed of 9 knots. Messages are sent by telegraph from the wheelhouse to the engine room. The various speeds are, reverse, slow, medium, and fast. When the barge is in a lock, or when passing moored boats, the engineer must stay in the engine room.

In the wheelhouse there is a compass which lights up at night. It is needed mostly on foggy nights in the Humber. There are windows all round the wheelhouse.

The crew's quarters on the motor barge are much larger than the quarters on the dumb barge. There is a table fastened to the wall, three beds, and a coal oven. They do all their cooking below. Fresh water is stored at the bottom of the barge. These barges on the Trent carry flour, hardboard, grain, coal, slack. There is usually a " dumb barge ", i.e. a barge which has no engine, towed by the motor barge. The dumb barge towed by the *Greendale* was the *Leicester Trader*. The dumb barge has more space for cargo. The tow-line is a strong steel rope.

The Crew. There are three men in the crew of the barge. The captain is responsible for the cargo, and he steers the barge through locks. The mate helps the captain, and they usually steer in turn. He also puts down the rope fenders when the barge goes through locks or comes alongside a quay. The engineer is responsible for the engine. There is a steersman on the dumb barge.

WAREHOUSE AND CARGOES

Nottingham warehouse is a tall building on the opposite side of the river Trent from West Bridgford. There are also many huts. Cargoes are transferred from barge to lorries, or to railway waggons, for the railway lines come right up to the warehouse. Cargoes can be stored in the warehouse or the huts until they are wanted. Unloading is done by crane.

At the warehouse there are cargoes consisting of hardboard, strawboard, plaster, soap, tinned food, cereals, tinned fruit, and rice. Other cargoes carried by the Trent barges are coal, slack, sand and gravel extracted from the many gravel pits along the banks of the Trent. Iron-ore from Scandinavia is brought from Hull to the furnaces at Scunthorpe where it is made into pig-iron. Ore is a very important cargo on Trent barges. Agricultural materials are also taken by barge—fertilisers, milling-offal, oilcake, cattle foods and timber. There are usually two dumb barges to one motor barge and the total carrying capacity is about 500 tons. The storage capacity at the Nottingham warehouse is about 21,500 tons. There is an emergency wharf at Fiskerton near Newark which can be used when the Nottingham wharf is closed or being repaired. Petrol and fuel oil are also taken by tankers from the petrol depot at Colwick.

DRAINAGE AND RIVER DEVELOPMENT

Years ago, the effect of high tides on the Trent and Humber often caused damage to the land round about. Before sluice gates and flood banks had been thought of the land near to the river's banks was constantly flooded. This overflow of the river made the area known as the " floodplain " swampy and unsuitable for farming. It was only after flood prevention and drainage of the flood-plain schemes had been organised, that profitable results were obtained from the land.

Flood banks have been built along the sides of the Trent for many years, similar to those used in Holland. These are built of mud and bundles of brushwood, reinforced by the roots of willows planted especially to add strength to the banks. Rock and stones are placed at the base to prevent the river from undercutting the banks. Nowadays, slag from Scunthorpe is used for this purpose.

One of the most common methods of draining a flood-plain is to erect pumping stations along the river banks. They disperse water left lying on the surrounding land after the river has overflowed its banks. Another much cheaper method which is still in use is the automatic sluice gate. These work only when the tide is flowing. As the tide rises, the gates remain shut, but when it ebbs to the normal river level, the automatic gates open and allow any surplus water to drain away. This method has been in use for a considerable time and during floods it has proved very successful. At low tide these sluice gates can often be seen let into the sides of the flood-banks. Mechanical sluice gates are less common, although there is a set at the junction of the River Trent and the River Idle. This was built because the land surrounding the Idle is lower than the highwater level of the Trent. This meant that at high tide there was a tendency for the Trent to flow into the Idle and flood its surrounding land.

THE NOTTINGHAM FLOOD PREVENTION SCHEME

After exceptionally heavy rain or snow, the Trent has several times flooded the low lying land in Beeston, West Bridgford, the Meadows and Wilford. This is partly due to the narrow channel near Trent Bridge which forms a bottle neck, and allows water to pile up behind it. To stop this, the channel has been widened and deepened, and lower down the river at Holme Lock, new sluice gates have been built to allow surplus water to get away more easily. There are to be new flood banks in places near Wilford and Colwick, and the channel is to be widened with a view to cutting out the old meanders near to Holme Cut. These meanders will be filled in.

RIVER MEANDERS

As a river goes down to the sea, it begins to meander slightly in and out of the flood plain because of the slight gradient. As it flows round a curve, it cuts deep into the outer edge because it flows more swiftly there. It flows slowly near to the inner edge of the curve, and consequently it deposits silt there. Gradually the curve becomes more circular, and in time the river starts to cut back on itself, and if it goes on long enough it will break through to form a separate lake called an ox-bow lake. This has happened at Burton and Bole.

FARMING IN THE TRENT VALLEY

The types of farming are principally cattle, fruit, and crop farming. Dairy farming is popular, and cheese is still produced locally (e.g. Colwick Cheese), but not in large quantities now because the retail dairyman can make cheese more quickly and more cheaply, and also because there are quick sales of milk in the nearby industrial towns. The main crops are wheat and sugar beet (there is a beet factory at Colwick), as well as potatoes and other hardy crops. Gardens and orchards occupy a large acreage of farmland, again, because of the quick returns on garden produce in the industrial markets. A typical dairy farm in the Newark district is about 160 acres, with three-fifths under grass. There is even more permanent grass in the farms between Newark and Gainsborough. The cereal crops are wheat, oats, and barley. There are breweries at Newark and Nottingham.

Although the flooding of the Trent has often caused much damage, it has also enriched the land from time to time with a layer of silt.

THE HUMBER

The Humber starts at the junction of the River Ouse and the River Trent. It is tidal. When a ship crosses the Humber, it follows a course marked with red lightships and buoys. These indicate the deep water channel. The sandbanks often move. Ships vary in size from the barges like the *Greendale* to seagoing vessels. There are factories and warehouses along the banks, particularly at Hull and Goole. On approaching the River Hull there is a floating pier called Victoria Pier. Here the New Holland ferry docks. It is a paddle steamer, because the water is sometimes too shallow for a propeller drive. The River Hull is known as the " Highway of Commerce " because the river leads into the heart of Hull's industries. The width of the river varies from 20 to 30 yards. Along the sides there are palm-oil factories, flour mills, gravel yards, petrol depots, quays and docks. Road bridges over the river are of the swing and crane type. When a barge wants to go under the bridge, a bell rings as a warning ; then the bridge swings to one side to let the vessl through. Motor barges and lighters guided by poles are very common on this river. Loading is done by chute, or by cranes.

KING GEORGE V DOCK

This dock is very large and ships from many countries come to it. Their cargoes may be fruit, grain, and raw materials. There are large cranes which can lift up to 50 tons. There are two coaling appliances on the north side of the dock. There is a dry dock for use when ships need painting or repairing. When a ship goes in to dry dock, it first enters, just like going into any ordinary lock. The gates are closed, and the water is pumped out. While this is being done, the ship is secured by cables, and wooden props are placed between the ship and the dock walls, to prevent it from toppling over. Men can work underneath the ship when the water is all pumped out.

Next to the King George V dock, there are huge grain silos for storing all kinds of foreign grain. The grain is unloaded from the ships by suction and conveyor. The conveyors lead from the side of the ship, under the warehouses, to the silos. There are eight miles of conveyors to take grain to any part of the silos. The silos are split up into bins, each containing grain of a different type. The silos hold over 80,000 tons of grain.

APPENDIX 2

A SELECTION OF BOOKS OF TRAVEL AND ADVENTURE, AND FICTIONAL WORKS WITH A GEOGRAPHICAL BACKGROUND, SUITABLE FOR GENERAL READING

THE books in this list do not form a comprehensive collection but they are chosen to indicate the type of reading which appeals to children, and which at the same time widens their geographical knowledge.

The division into age groups serves as a guide only, for children vary so widely in their reading habits. Many children of primary school age who are well taught and familiar with books are quite at home with reading really intended for older pupils. Thus, it is not at all uncommon to find children of eleven and twelve reading the full edition of John Hunt's *Ascent of Everest*, although there are two abridged editions intended for children of primary and secondary school age. The opposite is also true in the case of backward readers, although again, it is not unusual for children who would normally show a certain reluctance towards books, to discover a new interest in those which offer excitement and adventure if they are well illustrated and have an agreeable format. The attractive appearance of a book should be one of the factors which determines whether it should appear on the shelves. For this reason the choice of books ought to be made from specimen collections, not from the pages of the catalogues. Most County Libraries have special arrangements whereby the teachers in their area can view collections of books for school libraries before purchase.

There is no guarantee that all these books are still in print, although all of them are, or have been, very recently available. Many of the older classics, such as R. M. Ballantyne's *Coral Island*, and Sir Percy Fitzpatrick's *Jock of the Bushveld* have recently been reprinted, and now appear in most attractive form.

1. Up to 11 Years

These books for younger children deal with tales of adventure, tales of people and animals in other lands. They are not always strictly geographical, and their first purpose is to induce a love of reading, and to encourage children to turn to books for pleasure. In most of them, the atmosphere of the countries with which they deal emerges incidentally.

OLDER CLASSICS IN NEW EDITIONS

R. M. Ballantyne, *Coral Island*, Dent, 1951.
Rudyard Kipling, *The Just So Stories*, Macmillan, 1953.
Rudyard Kipling, *The Jungle Book*, Macmillan, 1952.
Rudyard Kipling, *All the Mowgli Stories*, Macmillan, 1952.
Rudyard Kipling, *Animal Stories*, Macmillan, 1953.
J. R. Wyss, *The Swiss Family Robinson*, Dent, 1951.
Johanna Spyri, *Heidi*, Collins, 1953.
R. L. Stevenson, *Treasure Island*, Collins, 1950.
Daniel Defoe, *Robinson Crusoe*, Collins, 1947.
Sir Percy Fitzpatrick, *Jock of the Bushveld*, Longmans, Green, 1953.

SERIES

Selections from the *Puffin Picture Books*, edited by Noel Carrington: R. B. Sergeant, *The Arabs*, Chiang Yee, *Lo Cheng*, Tsui Chi, *The Story of China.*
Arnrid Johnston, *Animals of India ; Animals of N. America ; Animals of Australia.*
The *Twins* series, published by Jonathan Cape.
The *Story Book* series, published by Wells Garner.
The *Where Does it Come From* series, published by P. R. Gawthorn, edited by Raymond Fawcett.
The *How Did They Live* series, published by P. R. Gawthorn, edited by Raymond Fawcett.

GENERAL

Ross Salmon, *True Jungle Stories*, Muller, 1954.
Ross Salmon, *True Cowboy Stories*, Muller, 1954.
Erle Wilson, *Far Away Tales*, Harrap, 1954.
Bernard Rutley, *Wild Life in the Ice and Snow*, Macmillan, 1950.
Bernard Rutley, *Wild Life in Canada*, Macmillan, 1950.
Bernard Rutley, *Wild Life in the Jungle*, Macmillan, 1950.
Alfred Wood, *Mishka and the White Reindeer*, Dent, 1947.
J. K. Monroe, *In His Little Black Waistcoat in Tibet*, Longmans, Green.

Denis Clark, *Black Lightning, the Story of a Leopard*, Hutchinson, 1950.
Denis Clark, *Boomer, the Life of a Kangaroo*, Hutchinson, 1954.
G. W. Barrington, *Jan, the Story of a Dutch Barge Dog*, Hutchinson, 1951.
L. S. Elliott, *Kangaroo Coolaroo*, Warne, 1950.
E. B. Tracy, *Paddles, the Story of a Sea-Lion*, Harrap, 1948.
Patricia Case, *Tiger! Tiger!*, Macmillan, 1949.
Theodore Waldeck, *Jamba the Elephant*, Harrap, 1947.
C. Barrett and I. Shead, *Kooborr the Koala*, O.U.P., 1940.
Dorothy Martin, *Munya the Lion*, Cumberlege, 1948.
Bernadine Bailey, *Einar : The Story of an Icelandic Boy*, Hutchinson, 1954.
Pipaluk Freuchen, *Eskimo Boy*, Harrap, 1953.
Post Wheeler, *Hathoo of the Elephants*, Hale, 1951.
Rose Brown, *Two Children of Brazil*, Muller, 1949.
S. Morice, *The Story of Wiremu : The Story of a Maori Boy*, O.U.P., 1949.
Pearl Buck, *The Chinese Children Next Door*, Methuen.
Pearl Buck, *Yu Lan*, Methuen, 1947.
Pearl Buck, *The Water Buffalo Children*, Methuen, 1945.
George Sava, *A Boy in Samarkand*, Faber, 1950.
Maria Gleit, *Child of China*, O.U.P., 1939.
Chiang Yee, *Dabbitse*, Methuen, 1944.
Chiang Yee, *Yebbin*, Methuen, 1947.
Gee Denes, *John and Jennifer on the Farm*, Nelson, 1948.
Gee Denes, *John and Jennifer Go Travelling*, Nelson, 1952.
Mildred Colbert, *Kutkos Chinook Tyee, Tales of Red Indians*, Heath 1947.
Charlotte Baker, *The House on the River*, Blackie.
Grace P. Garnier, *Paddylands*, Harrap, 1947.
Clifford Webb, *The North Pole Before Lunch*, Warne.
C. E. Gillham, *Beyond the Clapping Mountains*, O.U.P., 1944.
Eve Pownall, *The Australia Book*, John Lands, 1953.
D. Collins, *The Coral Sea Adventure*, Heinemann, 1951.
Rose Brown, *Three on a Raft*, Hodder and Stoughton, 1951.
E. J. Foote, *Pedro the Portuguese Cat*, C.U.P., 1948.
M. Neurath and J. Lauwerys, *How the World was Explored*, Max Parrish, 1951.
S. Fennimore and Dana Collins, *Sunset Plains*, Heinemann, 1953.
Robin Gurr, *Red Pepper : The Story of an Australian Horse*, Harrap, 1954.
Stephen Bone and Mary Adhead, *The Little Boy and His Home*, Dent, 1952.
Stephen Bone and Mary Adhead, *The Little Boys and Their Boats*, Dent, 1952.

John Hunt, *The Ascent of Everest*, Retold for junior children, U.L.P., 1954.

2. Between Eleven and Fifteen Years

SERIES

The *Young Travellers* series, published by Phoenix Press.
The *Lands and People* series, published by A. and C. Black.
The *Things We Need* series, published by P. R. Gawthorn.

GENERAL

G. L. Lamb, *Modern Action and Adventure*, Harrap, 1952.
Evelyn Cheeseman, *Sealskins for Silk*, Methuen, 1952.
Hans Hass, *Under the Red Sea*, Jarrolds, 1950.
Hans Hass, *Diving to Adventure*, Jarrolds, 1952.
J. Yves Cousteau, *The Silent World*, Hamilton, 1953.
M. Carter, *Friends of Empire*, Harrap, 1947.
Leslie Bailey, *Travellers' Tales*, Allen and Unwin, 1945.
R. and N. Polkinghorne, *Lands of the Commonwealth*, Harrap, 1950.

EXPLORATION

T. C. Bridges, *The Book of Discovery*, Harrap, 1935.
C. E. Key, *The Book of Recent Explorations*, Harrap, 1946.
D. Clark *Explorers and Discoverers*, Longmans, Green, 1951.
J. A. Brendon, *Great Navigators and Discoverers*, Heinemann, 1948.
L. E. Walter (Ed.), *Men of Courage* series, Newnes, 1952.
Capt. Joshua Slocum, *Sailing Alone Round the World*, Reprint Soc., 1943
C. W. Hodges, *Columbus Sails*, Bell, 1939.
C. Lloyd, *Capt. Cooke*, Faber, 1952.
Irene Plunkett, *Over the Edge of the World*, Lutterworth, 1951.
L. A. Kent, *He Went with Columbus*, Harrap, 1941.
Douglas Bell, *Drake was My Captain*, Warne, 1952.
J. A. Williamson, *Sir Francis Drake*, Collins, 1951.
L. Lewis, *Nansen the Adventurer*, Heinemann, 1948.
Kathleen Fidler, *To the White North*, Lutterworth, 1952.
Ronald Syme, *Hakluyt's Sea Stories*, Heinemann, 1948.
Ronald Syme, *Bay of the North*, Hodder and Stoughton, 1951.
Ronald Syme, *I, Mungo Park*, Burke, 1951.
Ronald Syme, *Cortez Conqueror of Mexico*, Hodder and Stoughton, 1952.
Ronald Syme, *I, Captain Anson*, Burke, 1952.
J. M. Scott, *Hudson of Hudson's Bay*, Methuen, 1950.
G. Seaver, *Scott of the Antarctic*, Murray, 1940.
H. Avery, *No Surrender*, Nelson, 1949.
E. L. Elias, *The Book of Polar Exploration*, Harrap.

G.T.G.

H. G. Ponting, *The Great White South*, Duckworth, 1949.
L. D. Hussey, *South with Shackleton*, S. Low, 1949.
F. Debenham, *In the Antarctic*, Murray, 1952.
W. M. Comer, *Wilfred Grenfell : Labrador Doctor*, Lutterworth, 1950.
Wilfred Grenfell, *The Story of a Labrador Doctor*, Hodder and Stoughton, 1953.
F. Illingworth, *Men Against the Arctic*, Venture Books, 1949.
Frank Crisp, *The Adventure of Whaling*, Macmillan, 1954.
E. Stefansson, *Within the Circle*, Scribner, 1945.
Thor Heyerdahl, *Kon Tiki*, Allen and Unwin, 1951.

ASIA

John Hunt, *The Ascent of Everest*, Retold for Schools (Senior Ed.), U.L.P., 1954.
John Hunt, *Our Everest Adventure*, U.L.P., 1954.
M. Cable and F. French, *Wall of Spears*, Lutterworth, 1951.
M. Cable and F. French, *China : Her Life and People*, U.L.P., 1949.
J. Hilton, *Lord of the Jungle*, U.L.P., 1947.
E. Lewis, *Young Fu of the Upper Yangtse*, Harrap, 1934.
E. Lewis, *Ho Ming, A Girl of New China*, Harrap.
N. F. Bradley, *The Old Burma Road*, Heinemann, 1945.
Bernard Llewellyn, *I Left My Roots in China*, Allen and Unwin, 1953,
Winifred Holmes, *Tekki's Hunting*, Bell, 1951.
M. Carter, *This is India*, Harrap, 1951.

NORTH AND SOUTH AMERICA

Angus McVicar, *Tiger Mountain*, Harrap, 1953.
Norman Dale, *Valley of the Snake*, Bodley Head, 1953.
T. Williamson, *The Last of the Gauchos*, Harrap.
Armstrong Sperry, *The Rain Forest*, Bodley Head, 1950.
M. McPhedran, *Cargoes on the Great Lakes*, Harrap, 1954.

AUSTRALASIA

Ann Shead, *To See the Queen*, Faber, 1953.
Mary Patchett, *Tam the Untamed*, Lutterworth, 1954.
S. Fennimore, *Bush Journey*, Heinemann, 1950.
F. Davison, *Man Shy : A Story of Men and Cattle*, Eyre and Spottiswoode.
L. Rees, *Quokka Island*, Collins, 1951.
Y. M. Robinson, *Blue Smoke*, Cumberlege, 1951.
Jean Vevanny, *Travels in Northern Queensland*, Jarrolds, 1951.
Evelyn Cheeseman, *Camping Adventures in New Guinea*, Harrap, 1948.
Evelyn Cheeseman, *Camping Adventures on Cannibal Island*, Harrap, 1949.

Evelyn Cheeseman, *Marooned in Du-Bu Cove*, Bell, 1950.
Tom Harrison, *Living Among Cannibals*, Harrap, 1943.

AFRICA

Eric Leyland, *Flame Over Africa*, Hodder and Stoughton, 1951.
Roy Campbell, *The Mamba's Precipice*, Muller, 1953.
J. A. Hunter, *African Hunter*, Hamilton, 1954.
Alex Campbell, *The Heart of Africa*, Longmans, Green, 1954.
C. Kearton, *In the Land of the Lion*, Arrowsmith, 1946.
E. Ghatti, *Here is the Veld*, Scribners, 1948.
John Brook, *A Pride of Lions*, Gollancz, 1954.
F. Debenham, *Kalahari Sand*, Bell, 1953.

EUROPE

Grace Jones, *John and Mary in Rome*, Muller, 1954.
Gary Hogg, *Norwegian Holiday*, Nelson, 1952.
Kate Seredy, *The Good Master*, Harrap, 1947.
A. G. Street, *Round the Year on the Farm*, Cumberlege, 1941.
J. Chipperfield, *Greeka : Eagle of the Hebrides*, Hutchinson, 1953.
Lionel Edwards, *Our Food from Farm to Table*, Methuen, 1951.
J. H. Bell, *British Hills and Mountains*, Batsford, 1950.
The "Country Life" Picture Book of Britain ; The "Country Life" Picture Book of London.
Odham's *Country Lover's Companion ; England Today in Pictures, The English Counties Illustrated, Britain Illustrated series, The British Heritage, The English Village in Pictures.*

3. Over Fifteen Years

Many of the books in the previous group will still be suitable for older children also, with the addition of the following :

The Geographical Magazine, Edited by Michael Huxley. Subscription Offices : 40-42 William IV Street, London, W.C. 2.
The National Geographic Magazine, Published by the National Geographic Society, Washington, D.C.

GENERAL

Per Host, *What the World Showed Me*, Methuen, 1953.
F. G. Smith and H. Chapin, *The Ocean River*, Gollancz, 1952.
Mildred Cable and Francesca French, *Journey With a Purpose*, Hodder and Stoughton, 1950.
Dr. Alain Bombard, *The Bombard Story*, Deutsch, 1953.
Bryn, Schlyberg and Oestmann, *Round the World in the Ho-Ho*, Tr. by Joan Wright, Bles, 1953.

Charles Violet, *Solitary Journey. The Third Voyage of the* Nova Espero, Adlard Coles, 1954.
Mary Dunn, The *We Go To. . . .* series, (We Go To Paris, Belgium, Luxembourg, Denmark), Harrap.

EXPLORATION

A. S. Mott, *Hakluyt's Voyages*, Blackwell, 1929.
M. Collis, *Marco Polo*, Faber, 1950.
Victor Slocum, *The Life and Voyages of Capt. Joshua Slocum*, Hart Davis, 1952.
J. H. Wood, *Exploration and Discovery*, Longmans, Green, 1952.
V. Stefansson (Ed.), *Great Adventures and Explorations*, Dial Press, 1952.
M. B. Synge, *A Book of Discovery*, Nelson, 1953.
Haakon Mielche, *Round the World with the* Galathea, *the Story of the Danish Oceanographic Expedition*, 1950-52, Wm. Hodge, 1953.
M. S. Lucas, *Vast Horizons. A Story of True Adventure and Discovery*, Harrap, 1948.
R. de la Croix, *Mysteries of the North Pole*, Muller, 1954.
Capt. R. F. Scott, *The Voyage of the Discovery*, (2 vols.) *The* 1901 *Expedition*, Smith Elder, 1905.
Capt. R. F. Scott, *Scott's Last Expedition*, Extracts from his personal Journal, Murray, 1923.
Admiral Lord Mountevans, *South With Scott*, Collins, 1938.
Admiral Lord Mountevans, *Arctic Solitudes*, Lutterworth, 1953.
Thomas Henry, *The White Continent*, Eyre and Spottiswoode, 1950.
Miriam McMillan, *I Married an Explorer*, Hurt and Blackett, 1951.
Hammond Innes, *The White South*, Collins, 1950.
Hammond Innes, *The Blue Ice*, Collins, 1951.
John Giaever, *The White Desert*, Chatto and Windus, 1954.
Kaare Rodahl, *North*, Heinemann, 1954.

ASIA

Hugh Ruttledge, *Everest* 1933, Hodder and Stoughton, 1941.
H. W. Tilman, *Mount Everest*, 1938, Hodder and Stoughton, 1948.
H. W. Tilman, *China to Chitral*, C.U.P., 1951.
H. W. Tilman, *Nepal Himalaya*, Hodder and Stoughton, 1952.
F. S. Smythe, *Camp Six*, Hodder and Stoughton.
F. S. Smythe, *The Adventures of a Mountaineer*, Hodder and Stoughton, 1945.
Eric Shipton, *Nanda Devi*, Hodder and Stoughton, 1936.
Lord Clydesdale, *First Over Everest*, Bodley Head, 1933.
John Hunt, *The Ascent of Everest*, Hodder and Stoughton, 1953.
W. H. Murray, *The Everest Story*, Dent, 1953.

Maurice Herzog, *Annapurna*, Cape, 1952.
Marcel Kurz (Ed.), *The Mountain World*, Allen and Unwin, 1954.
Andre Guibaut, *Tibetan Venture*, Murray, 1947.
G. Patterson, *Tibetan Journey*, Faber, 1954.
Heinrich Harrer, *Seven Years in Tibet*, Hart Davis, 1953.
M. Cable and F. French, *The Gobi Desert*, Hodder and Stoughton, 1943.
Ella Maillart, *Cruises and Caravans*, Dent, 1943.
Peter Fleming, *Travels in Tartary*, Reprint Soc., 1941.
Peter Fleming, *A Forgotten Journey*, Hart Davis, 1952.
Col. F. M. Bailey, *Mission to Tashkent*, Cape, 1946.
Col. F. M. Bailey, *China—Tibet—Assam*, Cape, 1945.
Hsaio Tung Foi, *Peasant Life in China*, Routledge, 1939.
Hsaio Tung Foi, *Earthbound China*, Routledge, 1940.
Hsaio Tung Foi, *Farmers of Forty Centuries*.
Fritz Muhlenweg, *Big Tiger and Christian*, Cape, 1954.
J. and F. Kingdon-Ward, *Assam Adventure*, Cape, 1941.
J. and F. Kingdon-Ward, *Burma's Icy Mountains*, Cape, 1952.
J. and F. Kingdon-Ward, *My Hill So Strong*, Cape, 1952.
Rudyard Kipling, *Kim*, Macmillan, 1908.
Pearce Gervis, *This is Kashmir*, Cassell, 1954.
Joy Packer, *Apes and Ivory*, Eyre and Spottiswoode, 1953.
Jim Corbett, *Man Eaters of Kumaon*, O.U.P., 1944.
Jim Corbett, *My India*, O.U.P., 1952.
Jim Corbett, *Jungle Lore*, O.U.P., 1953.
John Seymour, *Round About India*, Eyre and Spottiswoode, 1953.
Col. J. H. Williams, *Elephant Bill*, Hart Davis, 1950.
Col. J. H. Williams, *Bandoola*, Hart Davis, 1953.
C. M. Doughty, *Wandering in Arabia*, Duckworth, 1949.
R. S. Payne, *Journey to Persia*, Heinemann, 1951.
H. St. J. Philby, *Arabian Days*, Hale, 1948.
H. St. J. Philby, *Arabian Jubilee*, Hale, 1952.
H. St. J. Philby, *Saudi Arabia*, Benn, 1955.
Robert Graves, *Lawrence and the Arabs*, Cape, 1927.
A. Smith, *Blind White Fish in Persia*, Allen and Unwin, 1953.
Freya Stark, *The Southern Gates of Arabia*, Murray, 1936.
Freya Stark, *Ionia · A Quest*, Murray, 1954.
Diana Shipton, *The Antique Land*, Hodder and Stoughton, 1950.

NORTH AND SOUTH AMERICA

Bernard Hubbard, *Alaskan Odyssey*, Hale, 1952.
Helge Irmstadt, *Nunamuit : Among Alaska's Eskimoes*, Tr. by F. H. Lyon, Allen and Unwin, 1954.
K. Pinkerton, *Partners in the Wilds*, Bodley Head, 1951.

G.T.G.

K. Pinkerton, *Hidden Harbour*, Bodley Head, 1954.
Sebastian Snow, *My Amazon Adventure*, Odhams, 1953.
J. R. Ullman, *River of the Sun*, Collins, 1951.
Col. P. H. Fawcett, *Exploration Fawcett*, Hutchinson, 1953.
Conan Doyle, *The Lost World*, Murray, 1912.
Willard Price, *Amazon Adventure*, Cape, 1951.
Hugo Backhouse, *Among the Gauchos*, Cape, 1951.
Leonard Clarke, *The Rivers Run East*, Hutchinson, 1954.
Haakon Mielche, *Land of the Condor*, Wm. Hodge, 1947.

AUSTRALASIA

Sir Arthur Grimble, *A Pattern of Islands*, Murray, 1952.
J. C. Beaglehole, *Exploration of the Pacific*, Black, 1948.
Emily Hahn, *James Brooke of Sarawak*, Barker, 1953.
Olle Strandberg. *Tigerland and South Sea*, Joseph, 1953.
Jacques Chegaray, *My Polynesia*, Tr. by Robin Graham, Barker, 1953.
Frank Hurley, *Western Australia. A Camera Study*, Angus and Robertson, 1953.
Beryl Miles, *The Stars My Blanket*, Murray, 1954.

AFRICA

H. V. Morton, *In Search of South Africa*, Methuen, 1948.
Negley Farson, *Behind God's Back*, Gollancz, 1940.
L. Van der Post, *Venture into the Interior*, Hogarth, 1953.
Sylvia Leith-Ross, *Beyond the Niger*, Lutterworth, 1951.
J. A. Hunter, *Hunter. The Life of One of the Last White Hunters*, Hamilton, 1954.
Robert Ruark, *The Horn of the Hunter*, Hutchinson, 1954.

ENGLAND

H. J. Massingham, *Wold Without End*, Sanderson, 1932.
Thomas Firbank, *I Bought a Mountain*, Harrap, 1952.
H. V. Morton, *In Search of England*, Methuen, 1927.
B. Vesey Fitzgerald, *The Hampshire Avon*, Cassell, 1950.
H. E. Bates, *The Face of England*, Batsford, 1952.
R. M. Lockley, *The Way to an Island*, Dent, 1947.
S. P. B. Mais, *The English Scene Today*, Rockliff, 1949.
L. T. Rolt, *The Narrow Boat*, Eyre and Spottiswoode, 1945.
John Moore, *Portrait of Elmbury*, Collins, 1950.
John Moore, *Brensham Village*, Collins, 1951.
Thomas Armstrong, *King Cotton*, Collins, 1947.
Thomas Armstrong, *Dover Harbour*, Collins, 1949.
B. B., *Manka, the Sky Gypsy*, Eyre and Spottiswoode, 1939.
B. B., *Brandon Chase*, Hollis and Carter, 1947.

John Rogers, *English Rivers*, Batsford, 1948.
Selections from Batsford's British Heritage and Face of England series, and from their many other illustrated books describing the British scene.

EUROPE

Alan Brodrick, *Brittany* (Also Normandy, Provence, Touraine, Paris, etc.), Hodder and Stoughton, 1950.
Alfred Firth, *French Life and Landscape*, Elek, 1953.
Doré Ogrizek, *The Provinces of France*, McGraw Hill, 1951.
Doré Ogrizek, *Italy*, McGraw Hill, 1950.
Bernard Wall, *Italian Life and Landscape*, Elek, 1951.
R. Martin, *Italy*, Black, 1953.
Doré Ogrizek, *Scandinavia*, McGraw Hill, 1952.
Doré Ogrizek, *Spain and Portugal*, McGraw Hill, 1953.
Wilson McArthur, *Auto Nomad in Spain*, Cassell, 1953.
R. Martin, *Switzerland*, Black, 1951.
Doré Ogrizek, *Switzerland*, Kummerly, Berne, 1948.
Dawson Gratrix, *In Pursuit of the Vine*, Jenkins, 1953.
Barbara Whelpton, *A Window on Greece*, Heinemann, 1954.
H. V. Morton, *A Stranger in Spain*, Methuen, 1955.

APPENDIX 3

OPERATION AND MAINTENANCE OF OPTICAL APPARATUS

TEACHERS of geography need to know how to operate projection equipment for themselves, and how to look after it in normal routine maintenance. Extensive specialist knowledge is not required. Any teacher can acquire sufficient proficiency to use apparatus with proper regard for :

(i) The safety of the children,
(ii) The safety of the equipment,
(iii) The most efficient use of the equipment.

The types of apparatus likely to be found in geography rooms are these :

(i) The episcope,
(ii) The filmstrip projector,
(iii) The sound film projector,

The proper handling of these instruments is briefly described in the schedules which follow.

1. THE EPISCOPE

DESCRIPTION

The principle of episcopic projection is to direct light *upon* an object so that an image of it appears upright upon the screen.

Therefore, the fundamental parts of the episcope are these :

1. The lamp.
2. A set of mirrors and condenser lenses to concentrate the light upon the object.
3. A reversing mirror, to correct the image for the screen.
4. A projection lens.
5. An adjustable table to carry the object.

Notes on Description. A similar arrangement of these components is found in all episcopes. There may be other refinements on some models, but the principle in each case is the same. The *lamp* must be a powerful one, for there is much loss of light. 750

or 1,000 watts is the usual power. From such a lamp, there is not only light, but considerable heat also, and in some episcopes there is a plate of heat-resisting glass between the object and the lamp. Others reduce the lamp voltage through a resistance or transformer, which has the effect of reducing heat also besides certain other advantages.

OPERATION

Basically, the operation of the episcope is as follows:

1. Ensure that the supply is suitable for the apparatus.
2. Set up the projector ready for use.
3. Project a focused picture on to the screen.

Notes on Operation. The provision of electrical supply is not the teacher's responsibility, but it is useful to know that supply may be either A.C. (alternating current), or D.C. (direct current), and the plugs in the room should be marked accordingly, particularly if there should be both supplies in the same building, as sometimes happens. If the instrument operates on mains voltage, (usually 250 v.) it is plugged straight into the mains supply. If it has a transformer or a resistance, *this must be connected to the instrument first*, before the mains plug is connected. If a *transformer* is used, then the instrument may only be connected to *A.C.* supply; a resistance may be connected to A.C. or D.C. It is also useful to know that in the electrical circuit there is a fuse which blows if the load is excessive. Many modern plugs are of the Wylex 3-pin type, which incorporate a fuse, making replacement easy. The strength of the fuse is rated in *amps*. The power of the lamp is given in *watts*, and the mains supply in *volts*. The relationship between these is: $\frac{\text{Watt}}{\text{Volt}}=\text{Amp.}$ so it is always quite easy to work out whether the circuit will be overloaded or not before switching on.

Example: If the projector consumes 1,000 W.
And the mains voltage is 250 V.

$$\text{Then } \frac{1{,}000 \text{ Watts}}{250 \text{ Volts}} = 4 \text{ Amps.}$$

which is well within the capacity of a 15 amp. fuse, normally used in a power circuit. All these things can be found out by enquiry.

In setting up the episcope ready for use, the distance from projector to screen necessary for a suitable picture should be found, and the position marked on the floor. Cables should be laid where they will not catch the feet of children moving along gangways. As an extra precaution, it is a good practice to tie the cable to the leg of the table, or include in the cable a short length with a plug and socket connector. This will pull out if by chance anyone should trip over the cable, and so save the equipment from being pulled to the floor.

To project a focused picture on to the screen, the object is laid upon the table, with its bottom edge towards the screen. The table is then adjusted to press up against the glass plate, and the image is made sharp by adjusting the focussing ring on the lens.

MAINTENANCE

The maintenance of the episcope is very simple:

1. Know how to change a lamp.
2. Know how to clean the various components with suitable materials.

Suitable materials are, soft cloth, lens-cleaning tissue, or camel-hair brush. The mirrors and condenser lenses should be kept free from dust, as well as the glass plate below the object table. The reversing mirror is silvered on the front surface, and this should not be cleaned. If the episcope is kept properly covered when not in use, the interior should never accumulate excessive dust.

2. The Filmstrip Projector

DESCRIPTION

The principle of the filmstrip projector is to direct light *through* a transparency on which there is an inverted picture of the screen image. (Diascopic projection.)

Therefore, the fundamental parts of the filmstrip projector are these:

1. The lamp.
2. A reflector behind it.
3. A set of condenser lenses in front of it.
4. A heat filter.
5. A device to hold the transparency—either a filmstrip " gate ", or a 2 inch slide holder.
6. A projection lens.

Notes on Description. Since in this system, so much more of the light is usefully employed, lamp wattage can be lower. Efficiency of the optical system is often further improved by employing "bloomed" lenses, and by fitting a lens of focal length suitable for the length of throw. For most normal situations, the 2 inch lens is used for rear projection, and the 4 inch for forward projection. As in the case of the episcope, the projector may operate from mains voltage or on voltage reduced by means of transformer or resistance.

OPERATION

The operation of the filmstrip projector is as follows:

1. Ensure that the supply is appropriate for the projector.
2. Set up the projector ready for use.
3. Set the carrier for filmstrip, or for 2 inch slide as required.
4. Project a focused and framed picture on the screen.

Notes on Operation. The necessary knowledge of the electrical supply is the same in this case, as in the case of the episcope. It is simply necessary to know whether it is A.C. or D.C., the strength of the voltage, the strength of the fuse, the consumption of the projector, and whether it is fitted with transformer or not.

In setting up the apparatus ready for use, it is even more necessary to take precautions when laying cables that children do not trip over them, for the filmstrip projector is very small, and it is easily dislodged from its stand. The distance to the screen for a picture of suitable size should be found beforehand, and the position marked as before, remembering in this case that the distance will need to be altered when using single or double frame size filmstrip, or 2 inch slide. The throw should be tested before a picture is put in the gate, to make quite sure that the image will fall squarely on to the screen. When the object is inserted into the gate, it must be remembered that the picture must be *upside down*, and any printing reading from right to left, for the image is reversed by the lens. When the picture is on the screen, it should be made sharp by turning the focussing ring on the objective lens, and the "frame" lines removed by adjusting the strip in the gate. When moving from one picture to the next, the gate should be slightly opened so that the strip is not scratched as it passes through (nearly all instruments have provision for this in the design of the controls). After operation, the projector should be left to cool before being moved. When the lamp filasure that the picture falls squarely on the screen. When the oblong of light is adjusted satisfactorily on the screen, the lamp is switched off, and the next operation is to test the sound mechanism. For this, the volume is turned fully up, and the narrow beam of light from the exciter lamp is cut with a piece of paper two or three times. If the sound is in order, a characteristic crackle will be heard in the speaker. The projector is then switched off, and the various controls are set for the film to be used, i.e. sound or silent.

After this sequence of operations, the teacher passes on to *lacing the projector*. There is usually a lacing chart to guide him, but in any case the lacing is soon learned. It is necessary to see that the sprocket teeth engage correctly in the perforations of the film, and that the loops above and below the gate are of the correct size. This size is invariably marked on the projector. When lacing is complete, it is good practice always to operate the projector for a few turns by hand, to make sure that the film moves through smoothly. The projector is now ready to be switched on. The procedure is, to switch on the motor, and for a moment to watch the loops and see that they maintain their correct size. When the titles appear (which can be seen by watching the film in the light of the pilot lamp), the lamp is switched on, and as the titles appear on the screen, the image is focused and framed as for the filmstrip projector. Volume and tone are then adjusted, and the film should continue to run satisfactorily. The operator ought really to remain near to the projector while it is running, so that he can switch off immediately in case it is necessary. At the end of the run, the lamp should be switched off as soon as the end titles have finished. If the film should break during operation, the projector is switched off, the broken end is taken over the take-up reel, and a few turns by hand are given to wind it firmly on to the reel. The film is then re-laced.

Re-winding should always be done by hand, and at the same time the film is examined for broken sprocket-holes or other faults. If the film is on loan or hire from a film library, these should not be repaired, but the attention of the librarian should be drawn to these points when the film is returned.

MAINTENANCE

Maintenance of the sound film projector comprises routine attention to the following:

1. Optical system.
2. Film path.
3. Mechanism.
4. Plugs and cables.
5. Films and reels.

1. *Optical System.* The maintenance of the optical system is the same as for the filmstrip projector. In addition, there is the very small optical system of the sound optics, and all that needs to be done here is to keep the visible surfaces free from dust with the camel-hair brush.

2. *Film Path.* The various rollers and sprockets of the film path should be wiped clean. The gate and film channel need extra attention, for emulsion accumulates here, and it affects the running of the film if it is allowed to become hard. It should be cleaned away after each running, with the stiff brush provided for the purpose, or if very hard, with a splinter of hard wood, but *not* a penknife blade or other metal instrument.

3. *Mechanism.* The teacher's only responsibility here is to observe the instruction for lubrication which the manufacturers issue with their projector. In most modern projectors, lubrication is done at two or three oiling-points, after so many specified hours of running, and nothing more needs to be done. Any attention beyond this should be given by a service engineer.

4. *Plugs and Cables.* There are more cables with the sound projector than with the strip projector, and a periodic inspection of the plugs is a wise precaution. It is equally wise in the case of the filmstrip projector also, but the cables of this smaller instrument do not as a rule receive such heavy treatment.

5. *Films and Reels.* If film is held in the school library, the teacher should know how to splice a broken film. Otherwise, broken films are returned to their owners for repair.

Reels cause damage to film if the edges get pressed together. This is usually caused by carrying two or three reels together in the hand, and pinching the edges between finger and thumb. It is better to carry reels on the flat of the hand, and to inspect the edges before using the projector.

* * * * *

If the sequence of events given for the three main types of apparatus is followed, there is no reason why any geography teacher should not operate and maintain his own equipment. It is a useful accomplishment, for it is never very satisfactory to be dependent upon other persons when projection is needed. To assist with smooth operation, a *schedule of simple faults*, and the remedy for them, is given with this appendix. It is important that this should be regarded as a guide and not as an introduction to more extensive servicing by the teacher. Anything beyond this brief list, or any attention which is not included in the routine maintenance mentioned here, should not be done by the teacher, but should be passed to the service engineer.

Analysis of Simple Faults

Fault	Diagnosis	Remedy
Electrical		
1. Complete electrical failure.	1. Plug removed from socket.	Replace.
	2. Fuse failed.	Replace.
	3. One or more leads pulled from plug.	Repair.
2. Failure of lamp. (Or exciter or pilot lamp.)	1. Lamp burned out.	Replace.
	2. Dirty contacts of holder.	Clean.
Sound		
3. No sound.	1. Failure of mains.	See 1. above.
	2. Speaker lead pulled from socket.	Replace.
	3. One or more leads pulled from plug.	Repair.
	4. No scanning beam.	Replace exciter lamp.
	5. With D.C. supply.	Reverse mains plug.
4. Poor quality sound.	1. Speaker in a bad position.	Try others.
	2. Dirty sound optics.	Clean.
	3. Bad film.	—
	4. Bad acoustics in the room.	—
	5. Ripple due to bad smoothing.	Relace the film.
	6. Sound/silent switch in the wrong position.	Adjust.

FAULT	DIAGNOSIS	REMEDY
5. Lack of synchronisation between sound and picture.	1. Bottom loop too big.	Re-lace.
Picture		
6. Poor definition.	1. Bad focusing.	Focus.
	2. Dirty optical system.	Clean.
7. Unsteady picture.	1. Dirty gate; side runners clogged with emulsion.	Clean.
	2. Unsteady stand.	Adjust.
	3. Bad film.	Test by turning framing knob and observe black line.
8. Uneven illumination.	1. Lamp out of adjustment.	Adjust.
9. Dull picture.	1. Poor screen.	Try another.
	2 Poor blackout.	Remedy.
	3. Picture too large for power of lamp.	Move projector closer.
	4. Lamp blackened.	Replace.
	5. Lamp run at voltage lower than standard.	Adjust resistance or transformer to mains.
	6. Wrong flicker blade.	Fit correct blade.
10. Flicker.	1. Wrong blade.	Fit correct blade.
	2. Wrong speed.	Adjust speed switch.
Film		
11. Film take-up too slack or jerky.	1. Clutch incorrectly adjusted.	Adjust.
	2. Spool rims bent and snatching film.	Straighten.
	3. Belt slipping.	Adjust or replace.
12. Film perforations torn.	1. Jerky take-up.	See 11 above.
	2. Seized sprockets or spool spindles.	Examine and lubricate.

Fault	Diagnosis	Remedy
13. Constant loss of loops.	1. Dirty gate and side-runners.	Clean.
	2. Film incorrectly threaded.	Re-lace.
	3. Bad film—perforations previously torn.	Clear bad section by hand or re-lace.
14. Film breaks.		Switch off. Pass end of film from feed spool, over film on take-up spool, and re-lace.
15. Film scratched.	1. Dirty film path.	Clean.
	2. Revolving part seized (e.g. roller).	Examine and lubricate.
16. Sprocket teeth marks on film after projection.	1. Snatch due to 11 above.	Adjust.
	2. Film incorrectly threaded, teeth not engaged in perforations.	Re-lace.

APPENDIX 4

SOURCES OF GEOGRAPHICAL ILLUSTRATIVE MATERIAL

IN nearly every Local Education Authority there now exists a comprehensive service for the supply of visual material on loan to the schools, and for the majority of teachers this service constitutes their first source of supply. For those who wish to seek further, the following list has been compiled as a guide to some of the more prominent agencies which provide illustrative matter of use to teachers of geography.

PICTURES AND CHARTS

(i) PUBLISHERS

SUITABLE FOR WALL DISPLAY

Bell & Sons Ltd., York House, Portugal St., London, W.C. 2.
Harrap & Co. Ltd., 182 High Holborne, London, W.C. 1.
Macmillan & Co. Ltd., 10 St. Martin's St., London, W.C. 2.
T. Nelson & Sons Ltd., 3 Henrietta St., London, W.C. 2.
Nisbet & Co. Ltd., 22 Berners St., London, W. 1.
University of London Press, Warwick Square, London, E.C. 4.
Gaumont British Education Division (Charts Section), Imperial House, 80 Regent Street, London, W. 1.
Pictorial Charts Service, 3 Harrington Road, S. Kensington, London, S.W. 7.
Pilot Press Ltd., 45 Gt. Russell St., London, W.C. 1.
Daily Mail School Aid Dept., New Carmelite House, London, E.C. 4.

FOR AERIAL PHOTOGRAPHS

Photoflight Ltd., Elstree Aerodrome, Elstree, Herts.
Aerofilms Ltd., 4 Albemarle St., London, W. 1.
H. Tempest Ltd., Mundella Road Works, Nottingham, and 17-21 Castle St., Cardiff.
The Air Ministry, S. 4. (*d*), Whitehall Gardens, London, S.W. 1.
The Chief Photographer, British European Airways, Keyline House, Ruislip, Middlesex.

In addition to these sources, teachers can collect their own library of illustrations from back numbers of illustrated publications, particularly from :

Pictorial Education, published by Evans Bros. Montague House, Russell Square, London, W.C. 1. ;
The *Illustrated London News* ; The *Illustrated ; Picture Post* ;
The *National Geographic Magazine*, published by the National Geographic Society, Washington, D.C. ;
The *Geographical Magazine.*
Today, published by the Central Office of Information.

(ii) Government and Other Official Sources

The Central Office of Information, Baker St., London, W. 1.
The Imperial Institute, South Kensington, London, S.W. 7.
The British Museum, Bloomsbury, London, W.C. 1 and Cromwell Rd., London, S.W. 7.
The Science Museum, South Kensington, London, S.W. 7.
Ministry of Fuel and Power, 7 Millbank, London, S.W. 1.
Ministry of Agriculture and Fisheries, 55 Whitehall, London, S.W. 1.
United Nations Information Centre, Russell Square, London, W.C. 1.
The British Transport Commission, 26 St. Pancras Rd., London, N.W. 1.
Union of South Africa Publicity and Travel Bureau, Trafalgar Square, London W.C. 2.
Australian News and Information Service, Australia House, Strand, London, W.C. 2.
Canadian Pacific Railways, Publicity Agent, 62 Trafalgar Square, London, W.C. 2.
Canadian National Railways, 17 Cockspur St., London, S.W. 1.
Swiss Federal Railways, Strand, London, W.C. 2.
French Government Tourist Office, 178 Piccadilly, London, W. 1.
Indian Information Bureau, India House, Aldwych, London.
Irish Tourist Agency, 6 Eaton Gate, Westminster, London, S.W. 1.
United States Information Service, American Embassy, 5 Grosvenor Square, London, W. 1.
Greek Government Information Service, 34 Hyde Park Square, London, W. 2.

(iii) Commercial Sources

The International Wool Secretariat, Dorland House, 18-20 Regent St., London, S.W. 1.
The British Rubber Development Board, 19 Fenchurch St., London E.C. 3.
The Empire Tea Bureau, 22 Regent St., London, S.W. 1.

Cadbury Bros., Education Department, Bournville, Birmingham.
The Imperial Tobacco Co. Ltd., 141 Drury Lane, London, W.C. 2.
Imperial Chemical Industries Ltd., Nobel House, Buckingham Gate, London, S.W. 1.
Tate & Lyle Ltd., 52 Cadogan Square, London, S.W. 1.
Trinidad Lake Asphalt Co. Ltd., Tavistock Square, London, W.C. 1.
and a very large number of other manufacturing concerns, shipping firms, travel agencies and bus companies, who are willing to provide visual matter relating to their products or their service if teachers write direct to their publicity departments.

FILMS AND FILMSTRIPS

(i) EDUCATIONAL FILM LIBRARIES

The Educational Foundation for Visual Aids, Brooklands House, Weybridge, Surrey.
Encyclopedia Britannica, 102 Dean St., London, W. 1.[1]
Sound Services Ltd., 269 Kingston Rd., Merton Park, London, S.W. 19.
Educational Productions Ltd., East Ardsley, Wakefield, Yorks., and 17 Denbigh St., London, S.W. 1.
British Instructional Films Ltd., Mill Green Rd., Mitcham, Surrey.
Gaumont British Instructional Ltd., Aintree Rd., Perivale, Middlesex
Daily Mail School Aid Dept., New Carmelite House, London, E.C. 4.
Common Ground (film strips only), 44 Fulham Rd., London, S.W. 3.,
Unicorn Head (film strips only), Broadway Chambers, Broadway London, S.W. 1.
Picture Post (film strips only), Education Dept., Hulton Press, 43 Shoe Lane, London, E.C. 4.

(ii) COMMERCIAL LIBRARIES

The British Electrical Development Association, 2 Savoy Hill, London, W.C. 2.
The Petroleum Films Bureau, 29 Bond St., London, W. 1.
The British Gas Council, 1 Grosvenor Place, London, S.W.
Shell Film Unit, Shell Mex House, Victoria Embankment, London, W.C. 2.
British Rubber Publicity Association, 19 Fenchurch St., London, E.C.3.
Imperial Chemical Industries, Film Library, Nobel House, 2 Buckingham Gate, London, S.W. 1.
Timber Development Association, 71 Cannon St., London, E.C. 4.
Unilever Ltd., Information Division, Unilever House, London, E.C. 4.
Cadbury Bros., Publicity Department, Bournville, Birmingham.
Dolland and Aitchison Ltd., 37 Bond St., Leeds.

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[1] Now available from the Gaumont British Film Library.

(iii) GOVERNMENT AND OTHER OFFICIAL SOURCES

The Central Film Library, Government Buildings, Bromyard Avenue, Acton, London, W. 3.

Australian News and Information Service, Australia House, Strand, London, W.C. 2.

New Zealand Films, The New Zealand Film Library, Adelphi, John Adams St., London, W.C. 2.

United States Information Service, American Embassy, 5 Grosvenor Square, London, W. 1.

Chinese Government Information Service, 51 Cavendish St., London, W. 1.

Canadian Government Department of Trade and Commerce, Blackburn Rd., London, N.W. 6.

The National Film Board of Canada, Colquhoun House, Broadwick St., London, W. 1.

Canadian Pacific Railways, Publicity Agent, 62 Trafalgar Square, London, W.C. 2.

Union of South Africa Publicity and Travel Agency, South Africa House, Trafalgar Square, London, W.C. 2.

Irish Tourist Agency, 6 Eaton Gate, Westminster, London, S.W. 1.

French Films Delegation, 27 Queen St., London, W. 1.

The Army Kinematograph Corporation, West Huntington Hall, Huntington, York.

Note. (i) The sources mentioned above are not always restricted to the supply of one type of visual aid only. Many of the commercial concerns and the official agencies also, have pictures, films, strips and slides available, often related to the same topic. The Imperial Institute has a most comprehensive collection of visual material of all kinds, including specimens and samples specially arranged for use in schools. Teachers may obtain full details of the service available by writing for the catalogues which the majority of these sources issue.

(ii) The Geographical Association, c/o The Park Branch Library, Sheffield, 2, also offers a useful service to its members including a library, the quarterly journal of the Association—*Geography*, visual information, special sets of Ordnance Survey sheets at reduced rates, and close association with such bodies as The School Journeys Association, The Council for the Promotion of Field Studies and the Ship Adoption Society.

(iii) The Association of Agriculture, 53 Victoria St., S.W. 1., has detailed descriptions of farms selected from various parts of this country and the Commonwealth, which are well illustrated and very suitable for sample studies.

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